COTTON

Volume LXXXI
Number Eleven
Twenty Cents a Copy

SEPTEMBER, 1917

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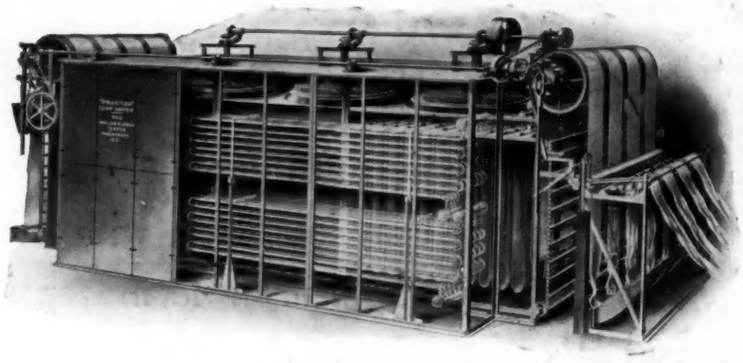

AUTOMATIC TYPE
"Proctor" All-Metal Dryer for cotton knit goods, turkish towels, etc.

When you consider that our age makes us the oldest and the demand for

"Proctor" DRYERS

makes us the largest dryer specialists in America, don't you feel there may be something very worth while in our product and our service?

Write for catalog, stating material to be dried.

THE PHILADELPHIA TEXTILE MACHINERY CO.
PHILADELPHIA

PROVIDENCE, R. I.
Howard Building

CHICAGO, ILL.
Lytton Building

CHARLOTTE, N. C.
H. G. Mayer, Realty Building

17-8

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NORTHROP

Trade-Mark Registered

LOOM REPAIRS

Our loom repair prices are purposely made low as we are mutually interested with our customers to keep the annual loom repair account low.

Job foundries machine shops and supply houses do not have our interest in the results obtained from Northrop Looms

We carry several hundred tons of finished loom repairs in stock for the convenience of our customers

DRAPER CORPORATION

HOPEDALE MASSACHUSETTS

Southern Office
188 South Forsyth Street Atlanta Georgia

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Dutcher Temples

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DRAPER CORPORATION

SOLE MANUFACTURERS

HOPEDALE MASSACHUSETTS

Southern Office
188 South Forsyth Street, Atlanta Georgia

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THE SECOND

SOUTHERN TEXTILE EXPOSITION

to be held in the coming

NOVEMBER, 1917

IS ANNOUNCED BY THE SOUTHERN TEXTILE EXPOSITION (Inc.)

All kinds of machines, supplies, materials, and fabrics of interest to manufacturers of cotton textiles will be exhibited.

The full announcement and regulations just off the press may be had by addressing the

SOUTHERN TEXTILE EXPOSITION, Inc.
GREENVILLE, S. C.

CROMPTON & KNOWLES LOOM WORKS

LOOMS

WORCESTER, MASS.

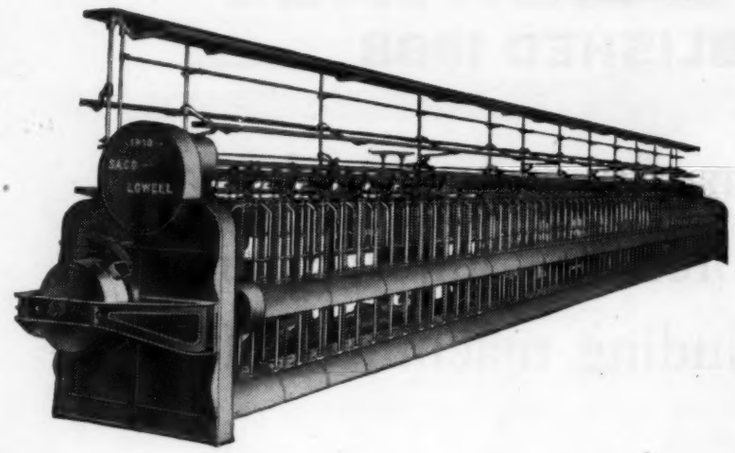
PROVIDENCE, R. I. **PHILADELPHIA, PA.**

Alexander & Garsed, Charlotte, N. C., Southern Representatives.

SACO-LOWELL SHOPS

TEXTILE MACHINERY

INCLUDING



ROVING FRAMES

OF

IMPROVED DESIGN

AND

CONSTRUCTION

SLUBBER FRAMES

INTERMEDIATES

FINE FRAMES AND

JACK FRAMES

SHOPS

BIDDEFORD, ME. LOWELL, MASS. NEWTON UPPER FALLS, MASS.

EXECUTIVE OFFICES

BOSTON, MASS.

ROGERS W. DAVIS, Southern Agent, CHARLOTTE, N. C.

Two Recent Developments

In Automatic Weaving

Automatic Tire Fabric Loom

Automatic Silk Loom

We make automatic looms for
all manner of textile fabrics.
Plain or fancy, coarse or fine.

"IDEAL"

The Stafford Company

Readville, Mass.

Southern Office - - - Charlotte, N. C.

"IDEAL"

B. S. ROY & SON CO.

ESTABLISHED 1868

The only firm in the world exclusively devoted to building and improving grinding machinery for textile mills.

WORCESTER, MASS.

GRATON & KNIGHT

Standardized Series

LEATHER BELTING

Tanned by us for belting use

GRATON & KNIGHT

Common Sense in the Standardization of Belting

You have standardized your signature.

You buy standardized tools, standard printing paper and a hundred other standardized things, instead of having them made to order. It is safer for you—easier and more economical.

Why don't you standardize your belting?

Consider what standardization has done for your own product; for other products you use.

Translate these advantages into terms of belting.

Analyze belt installations. You find the requirements of power transmission fall into a small number of sharply defined classes—about a dozen if you define them scientifically.

Standardized Belting offers you a standard belt that is exactly suited to each one of these classes. You adopt the one that is fitted to the needs of your own work. That is standardization—just plain common sense applied to power transmission.

There are Graton & Knight Heart, GraKnight, GraKnight Dynamo, Spartan, Neptune and other Standard Brands—all standardized on the basis of work to be done and conditions to be met.

Standardize your belts. Consult our representatives. Submit your power transmission problems to our mechanical laboratory—get *expert* advice.

Write for description of Graton & Knight Standardized Series of Leather Belts, with full information about Standardization as applied to Belting.

The Graton & Knight Mfg. Company

Oak Leather Tanners, Makers of Leather Belting, Lace Leather, Packings and Specialties

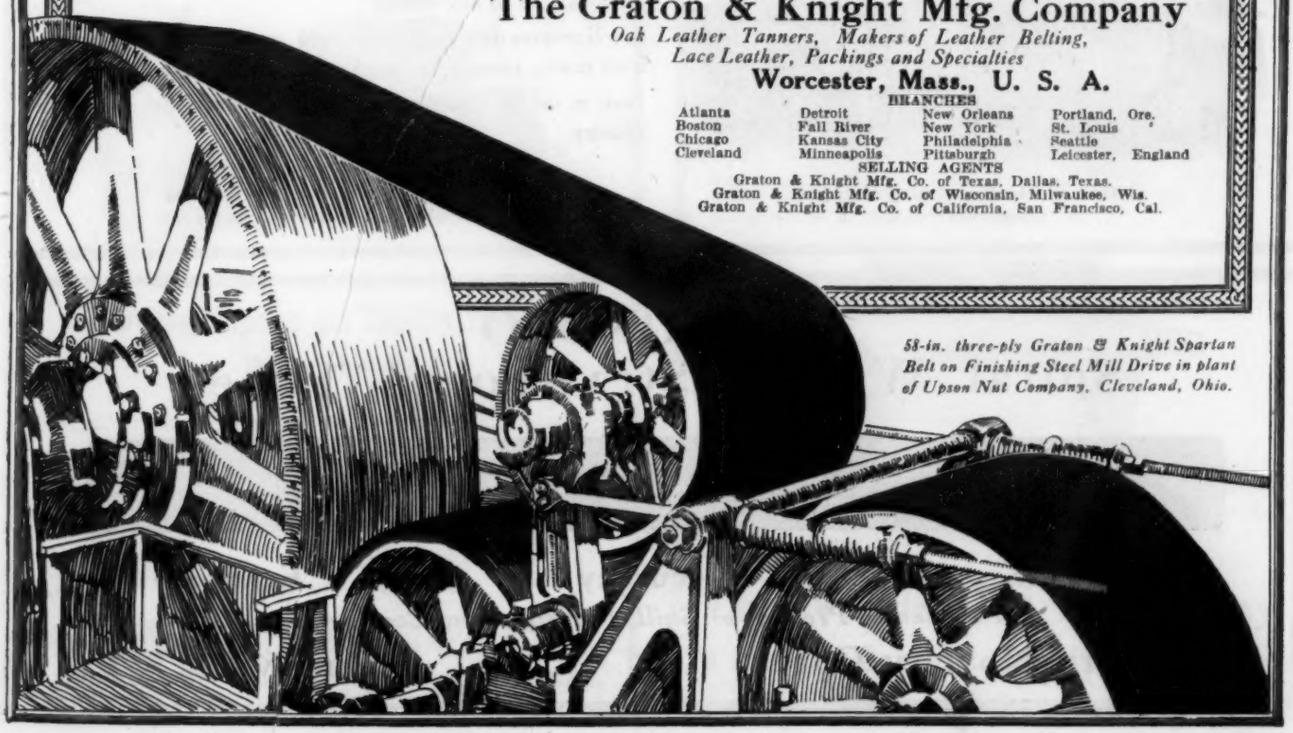
Worcester, Mass., U. S. A.

BRANCHES

Atlanta	Detroit	New Orleans	Portland, Ore.
Boston	Fall River	New York	St. Louis
Chicago	Kansas City	Philadelphia	Seattle
Cleveland	Minneapolis	Pittsburgh	Leicester, England

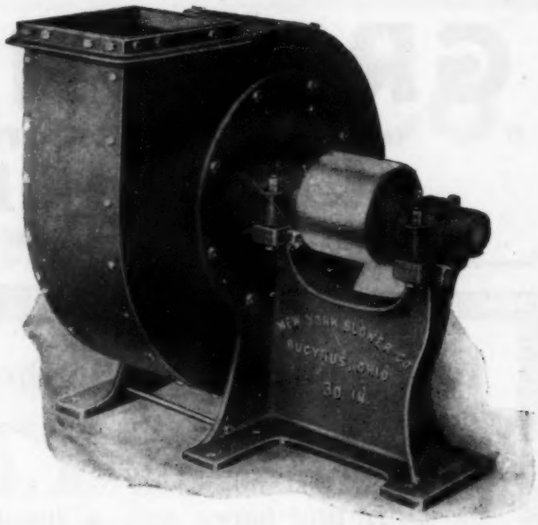
SELLING AGENTS

Graton & Knight Mfg. Co. of Texas, Dallas, Texas.
Graton & Knight Mfg. Co. of Wisconsin, Milwaukee, Wis.
Graton & Knight Mfg. Co. of California, San Francisco, Cal.



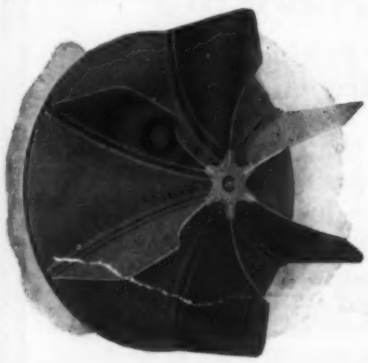
58-in. three-ply Graton & Knight Spartan Belt on Finishing Steel Mill Drive in plant of Upson Nut Company, Cleveland, Ohio.

The Fan That Solved The Problem



One of the problems arising around every cotton mill is the suitable handling of the raw material from the opening room to the point where it enters the machinery in the picking department. Many systems have been devised to secure the efficient handling of this material, avoiding at the same time as many of the common difficulties arising with such systems as possible.

The fan that solved the problem is our Reversible Fan. One of the reasons for its success is because of the construction of the fan wheel, which is constructed with a cone-shape back of cast iron, into which the steel blades are cast solidly, thus eliminating all rivets, bolts and screws which are liable to work loose and cause trouble. The wheel is so formed as to offer the least resistance to the material passing through the fan, and on account of this important feature of design proves particularly satisfactory with stringy material such as cotton, shoddy, rags, etc.



Heavy steel plate housings, small details of the fan construction such as high carbon steel shafts and chain oiling bearings—in fact every detail of this reversible fan is fully up to the recognized high standard to be found in all our products.

Our catalog R.F. explains fully. Ask for it today.

Our fans and air washers have set a standard for cooling, heating and ventilating. Catalogs Nos. 65 and 67 show the complete line. Write for them today.

The New York Blower Co.,

Main Office: Archer Ave., and Canal Street., CHICAGO, ILL.

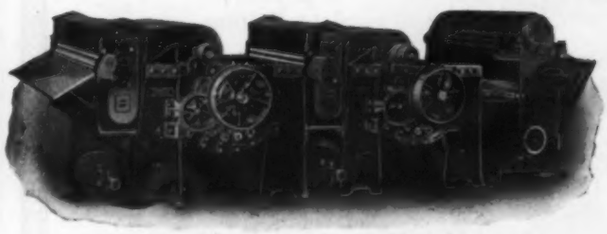
Works: BUCYRUS, OHIO

Leader-News Bldg. Cleveland, O. | Ridge Arcade Bldg., Kansas City, Mo. | 502 Plymouth Bldg., Minneapolis, Minn. | 303 B. F. Jones Bldg. Pittsburgh, Pa. | 12 Railroad Place, East Orange, N. J.

BUILT RIGHT RUN RIGHT

SMITH & FURBUSH MACHINE CO.

PHILADELPHIA, PA.



Cotton Waste Reclaiming Machine
(Shaughnessy Patent.)

This machine does work never before accomplished and cannot be compared to any other.

It will remove dirt, shell, seeds, leaf or other foreign matter from motes, sweeps, fly, strips or damaged cotton.

Now in use by a number of the best mills throughout the country.

Send for Circular S-90.

We also build a special Willowing outfit for cotton waste—Circular S-9

Use SONOCO
Spiral Wound Strawboard Tubes

Strength **Accuracy** **Economy**

A Perfected Product of Skill, Foresight and Conscience

Southern Novelty Co., Hartsville, S. C.

Are Your Time Records Accurate and Indisputable?

Are you preparing to comply with the Keating-Owen Bill by keeping an accurate record of your employees' working hours?

Unless some automatic system is installed in your mill, it will mean the employing of an experienced timekeeper, and even then the accuracy of the time record depends entirely upon the fallibility of one man.

You must avoid the possibility of human error. A time record to be of any value MUST be mechanically accurate beyond dispute.

To protect you and your employees and satisfy the government inspectors, you need a

HOWARD Time Recorder

which provides a perfect time record of each employee, the accuracy of which is indisputable. This recorder proves conclusively when the employee is late for work and the exact number of hours and minutes he works.

The absence of complications in the mechanism of the Howard Time Recorder is a guarantee of its accuracy and durability.

Howard Time Recorders are now in use in a number of well-known mills, and more and more mills are installing them.

Catalog and full information sent gladly upon request. Drop us a line today.

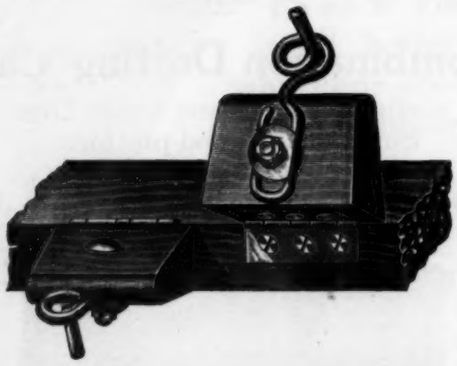
Howard Time Recorder Co.

67 Maiden Lane, Room 705, NEW YORK CITY

Jewelers Building, 373 Washington St., Room 38, BOSTON, MASS.

103 State St., Room 805, CHICAGO, ILL.

The Palmer Adjustable Thread Guide



For Ring Spinning and Twisting Frames

Easily adjusted.

Extreme accuracy and permanence of setting.

Cheapest of them all.

Mail guide-block for free sample.

Patented and manufactured by

THE I. E. PALMER COMPANY

Middletown, - - - Connecticut.

Set a mark for each operator—

Expect **so much** from each man, each machine. See that each operator **makes the mark.** Measure out the task—say, so many picks per loom. Make this the **minimum** for any day's work. Then record each loom's output with

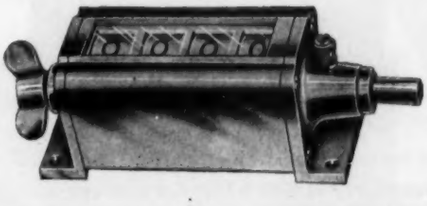
Veeder

Loom Pick Counters. Pay the operator for completing his assignment—with possibly a bonus for **exceeding** it.

The Loom Pick Counter shown at right is designed especially for looms, and intended to be driven from crankshaft. It shows in plain figures the actual work done.

The above instrument indicates picks in thousands up to 100,000,000 picks—and repeats. Can be furnished to read in either hundreds or thousands of picks.

The Revolution Set-Back Counter below records very accurately the length of material passing over the roller from which counter is driven. Especially useful on finishing machinery such as Drying, Mangling, Tentering, Napping, Dyeing and Calendering Machines. Also suitable for Doubling and Winding Frames, and for Beaming Machines as a *yardage indicator.*



Very likely you have use for other textile counters besides the ones shown here. Ask for booklet covering the complete textile line.

The Veeder Mfg. Company

6 Sargeant St., Hartford, Conn.

FIG.27

Lane Roving Truck

Mounted on our improved Thread-guard Casters. No clogging up of bearings. Light, easy running and extremely durable.

LANE
CANVAS MILL BOXES
and
Trucks

Made of King Cotton and Steel

FIG.20.

Lane Baskets

are made of strictly long staple cotton duck of great tensile strength. Spring-steel frame is practically indestructible. Rim bound with tough leather.

Sold direct and by leading Supply Houses.

W. T. Lane & Brother, Manufacturers, **Poughkeepsie, N. Y.**

The Buyer Who Knows
Will Always Buy
Keystone Receptacles
Keystone Quality is the Standard
FOR ALL MILL BUYERS

Warehouse Car Showing Bottom Construction.

Noted for their Construction, Quality and Durability.

The superiority of **KEYSTONE Products** is the result of our years of experience in the manufacture of fibre products.

Make no purchases of mill receptacles until you have informed yourself on the quality and prices of **KEYSTONE Products.**

Send your address on a postcard, *now*, and we will forward Catalogue "D."

KEYSTONE FIBRE COMPANY, Yorklyn, Del.

Southern Agent, H. C. Smith, Greenville, S. C.

Hercules
TRADE-MARK REGISTERED

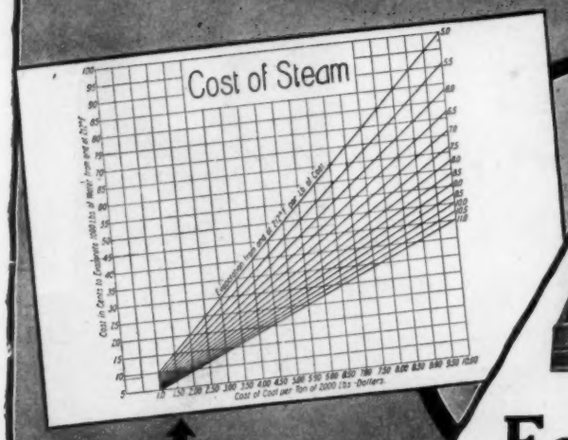
Combination Doffing Cars

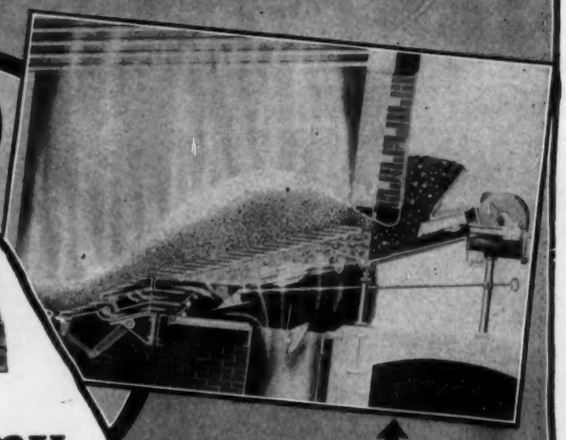
One stationary and one loose fibre box.
Substantial wood platform.
Self-oiling wheels.
Boxes may be steel clad if desired.

Vulcanized Fibre
Roving Cans, Boxes, Trucks, Barrels, Baskets, etc.
Write for Catalog No. 19.

FIBRE SPECIALTY MFG. CO.
Kennett Square, Pa.

Westinghouse
Underfeed Stokers





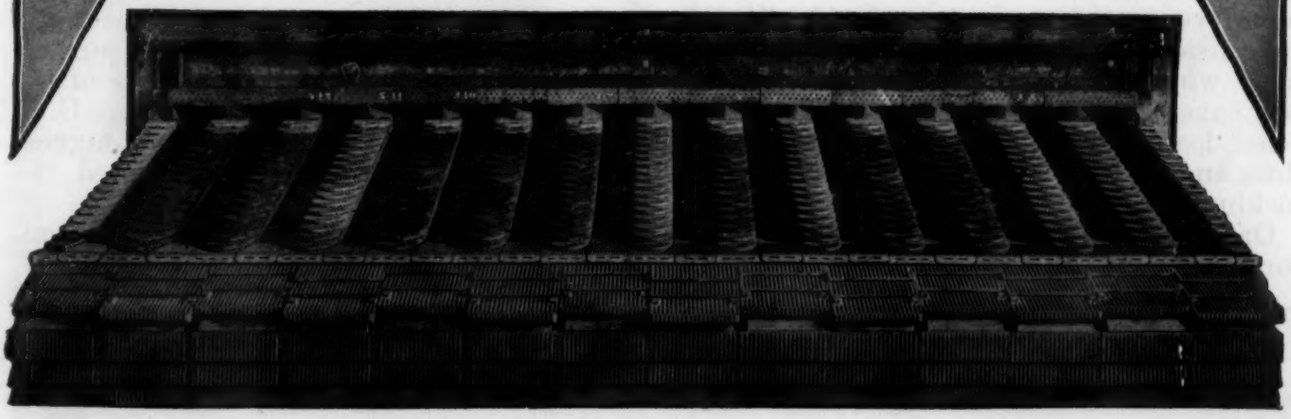
Knowing the price and the amount of coal burned, and the quantity of water evaporated, the above table will tell you what it should cost you in cents per lb., to generate steam. This is a very useful table. We will gladly mail you a copy upon receipt of your name and business address.

Economy
and
Reserve Capacity
For All

No waste—No idle equipment—No Banked Fires— No Boilers to be held in readiness for the daily peaks. FOR, the Westinghouse Underfeed Stoker embodies in its design a wonderful flexibility— a tremendous overload capacity

Even if you have but one or two small boilers, there is no reason why your economies and your reserve capacity should not be relatively equal to those of the big central station. Westinghouse Underfeed Stokers are built in many sizes and for all steaming requirements.

Westinghouse Electric & Manufacturing Company,
East Pittsburgh, Pa.



A TRUCKMAN HAS 8 HANDS!

WITH

COWAN

TRANSVEYORS

IN these days of labor scarcity we can't afford to scatter men over the mill doing unnecessary work. Every misspent motion must be made use of. Every ounce of energy of every man must be made productive.

Consider your trucking item. Right here is where you can save a number of men, and put those extra truckers on more productive work.

Suppose you could get one man with one truck to do the same work in less time than four of your present truckers do it. Would you consider it? Of course you would, and that's why you need Cowan Transveyors. They save rehandling of goods, eliminate the useless loading and unloading of trucks, stop piling and repiling of goods before and after trucking.

One man with a Cowan can do the work of four men with old style trucks—because all he does is trucking—no loading and unloading. It enables you to substitute cheap wooden platforms for expensive platform trucks.

The effects of installing the Cowan System is felt throughout the whole mill. Aisles are clean, confusion and delay is eliminated, time is saved, no energy is wasted, business is speeded up, and many dollars are clipped from overhead expenses.

The Cowan Transveyor is the pioneer elevating truck, and therefore meets your requirements more satisfactorily. Some of the largest textile plants in the country, the U. S. Government, and hundreds of the biggest concerns in the country have adopted the Cowan System.

Made in any size for any requirement. Write for catalog today.

THE COWAN TRUCK CO., - Holyoke, Mass.

Makers of Cowan Transveyors.

SPAULDING TRADE Fibre MARK PRODUCTS

The Sign of Superior Quality Fibre Boxes

Style B. Fibre Box.

SPAULDING FIBRE BOXES are becoming part of the equipment in up-to-date textile manufacturing and jobbing establishments.

Like all other receptacles bearing the Spaulding Trade Mark, they are recognized by textile men throughout the country as perfection in this class of product.

They are made of the most superior quality of fibre, and steel reinforcements throughout protect the fibre from hard knocks. Made with either wood or fibre bottom.

Their lightness, combined with utmost strength and durability, means less effort, and a saving of time and money.

Any size desired. For sale by all leading mill supply houses. Catalog and detailed information gladly sent on request.

Style C. Steel Clad Truck

J. Spaulding & Sons Co.

ROCHESTER, NEW HAMPSHIRE

One of the Many Satisfied Users

This picture shows a Kron Scale purchased in 1914 by the Public Weigher of the County of Wilson, N. C., which the Public Weigher says is proving highly satisfactory.

"Load & Look"

American Kron Scales

AUTOMATIC **SPRINGLESS**

Made in U. S. A.

All Metal Construction

are proving a great time and labor saver—therefore a money saver—in hundreds of Textile Mills and Industrial Plants of every description and are saving thousands of dollars yearly to the users.

With Kron Scales there are no adjustments of weights to be made. The load is pushed on the platform—the pointer flies to the correct weight on the dial—the reading is accurately made—then the load is taken off. The weighing takes but a few seconds. There's no chance for guessing—no false motions—no time wasted.

You can figure for yourself how much time, labor and money this instant, exact, automatic weighing will save you in your business.

Made in types to meet all requirements. Any capacity.

Write for catalog and complete information.

American Kron Scale Co.

422 East 53rd St., New York.

BOSTON—Rice Bldg., 10 High St.
PROVIDENCE—125 Washington St.
HARTFORD—847 Main St.
PHILADELPHIA—506 Franklin Bank Bldg.
PITTSBURG—412 Bessemer Bldg.
BALTIMORE—746 Reservoir St.
CHICAGO—58 East 11th St.
CLEVELAND—610 Union Bldg.
DETROIT—521 Free Press Bldg.
MINNEAPOLIS—602 Boston Block.
SAN FRANCISCO—156 Fourth St.
WILSON, N. C.—Opp. Chamber of Commerce.

Southern Office—405 Urban Bldg., Louisville, Ky.

It Both Weighs and Counts

It's The Dormant

NATIONAL COUNTING MACHINE

YOU can get a double check on the accuracy of the count or weight, or both, of incoming stock or material or outgoing finished goods.

The machine is fitted to give you an accurate count of the platform load by ounces, dozens or by gross.

Inaccuracy of either weight or count is costly. The National Counting Machine, for weighing purposes, is more sensitive and accurate than any dormant scale on the market. Its counting mechanism is an exclusive feature not found in any scale.

There are National Counting Machines of varying types and capacities to meet the requirements of all textile users.

SEND FOR ILLUSTRATED CATALOG CA

National Counting Machine Co.

Distributors for the National Scale Co.

9 Bank Street, Chicopee Falls, Mass.

Also Builders of National-Chapman Elevating Trucks

National Counting Machines used by textile mills are of various sizes, including portable platform and counter type machines of various capacities.

LEATHEROID ROVING Cans

Smoothest Can Obtainable

"Leatheroid" No. 1 Seamless Roving Cans

Patented "Leatheroid" rolled top, rolled in and under two and one-half times, having no steel rim underneath the roll to break the can. Solid steel bottom, steel chime, 6 in. kicking band. We guarantee this can in every respect.

Made in 10" and 12" diameter x 36" high.

Leatheroid Sales Co.

1024 Filbert St., Philadelphia, Pa.

Selling Agents for the Leatheroid Mfg. Company

Sold by Southern Textile Mill Supply Houses

"STANDARD" MILL EQUIPMENT

Superior Products That Last Longer

STANDARD TAPERED FIBRE BASKETS.
"STANDARD" FIBRE CARS.
ROVING CANS—TRUCKS—BARRELS—DOFFING CARS—BASKETS—BOXES—ETC.

Write today for catalog.

STANDARD FIBRE COMPANY

Miller Street, Somerville, Mass.

WHITE TRUCKS

WAR conditions will prove quickly what years of peace service have been steadily evincing, that the best trucks are the cheapest, regardless of price. They last longer, do more work, cost less to operate.

The small truck user should follow the lead of his big competitor and back up his truck operations with White Service Facilities and White Trucks.

The truck which cannot stand up under high pressure operation will fail in the most vital respect—uninterrupted work. It will depreciate rapidly, with ever diminishing efficiency and ever increasing repairs.

Do not handicap yourself and the nation by trying to use trucks that will not stand the strain of constant service—this is no time to tinker with inferior machinery.

THE WHITE COMPANY

CLEVELAND

Largest Manufacturers of Commercial Motor Vehicles in America

A DEFINITE INSTANCE OF PRACTICAL ECONOMY

ONE of the largest Textile Mills finds the Automatic Storage Battery Electric Truck, as pictured here, of the greatest value in handling flax bundles from warehouse to mill. It is doing the work formerly done by a two-horse team and five men. Complete facts and catalog for the asking. Write now!

The Automatic Transportation Co., 2933 Main Street, Buffalo, N. Y.

The only truck manufacturers to receive gold medal and highest award at the San Francisco Exposition. Pioneer manufacturers of industrial trucks.

Efficiency Demands The Elimination of Friction in Bearings

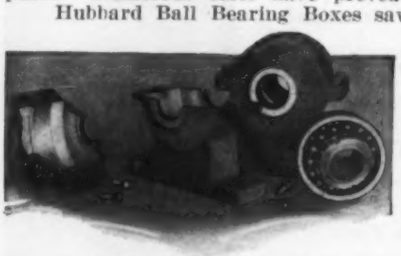
Hubbard Beater Box Disassembled, showing S. K. F. Ball Bearing.

Efficiency and economy are being sought by every textile manufacturer, and the question of **bearings** cannot be overlooked if you are seeking TRUE efficiency.

No machine can run efficiently and economically when there is friction in its bearings—and there's friction in every plain bearing. Friction means a loss in power and oil, reduction in speed and a time loss caused by shut-downs to repair bearings.

The savings effected by Hubbard Ball Bearing Boxes on cards, beaters and fan shafts are recognized and undisputed. Numerous tests have proved that the power saving alone has been from 10% to 15%.

Hubbard Ball Bearing Boxes save power by eliminating bearing friction—they reduce machinery upkeep costs, because they require little attention, do not wear, and therefore do away with machine part renewals—they give increased production for a given power cost and frequently a large increase in the quantity as well as the quality of production—they reduce the wastage of goods soiled by oil stains—they prevent shut-downs and speed up the machinery to the maximum and the speed is maintained uniform.



Hubbard Card Cylinder Box.

The first Hubbard Boxes were applied to pickers in 1912 and these boxes are still in daily service, which proves their durability.

For a small outlay you can change your plain bearings over to Hubbard Boxes– no expensive machining or dismantling required. The installation will pay for itself in a short while.

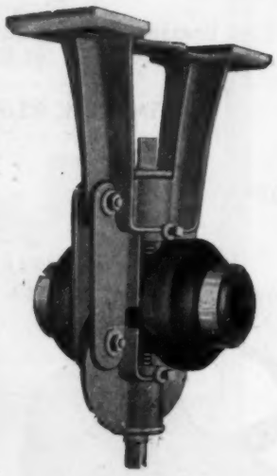
Our bulletin is well worth reading. Tell your stenographer to drop us a line asking for it today.

HUBBARD MACHINE COMPANY, Worcester, Mass.

L. L. NAKASHIAN, Charlotte, N. C., Room 1114 Independence Bldg., Sou. Agent.

HUBBARD BALL BEARING BOXES

Chapman Ball Bearings

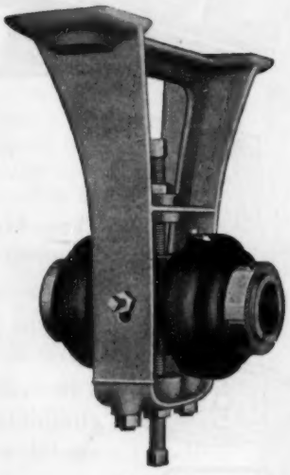


Style A

Designed for Shafting

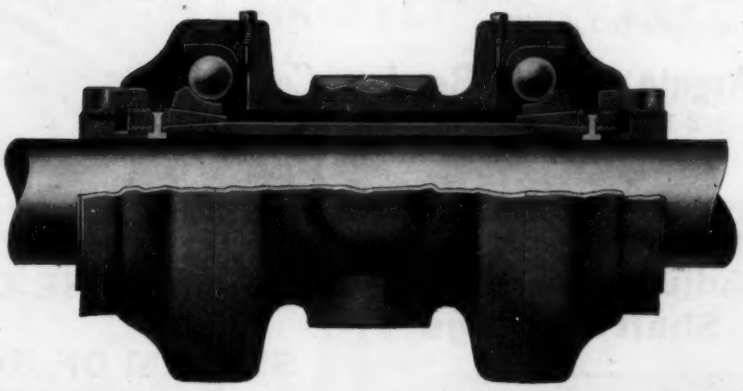
will fit any standard hanger frame, and are interchangeable with self oiling boxes of the same shaft size.

You can obtain more uniform product and eliminate oil-spoiled goods at a decreased cost for power by using



Style B

Save 75% Friction



Reduce 95% Lubrication

CHAPMAN BALL BEARINGS

for

Style C

Shafting — Counter Shafting

Loose Pulleys — Friction Clutches

Mule Stands — Guide Pulleys

Power Tables, etc.

Style D

BRANCH OFFICES

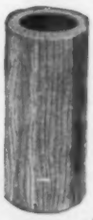
New York
Room 101,
No. 30 Church St.

Philadelphia
Bourse Building

TRANSMISSION BALL BEARING CO., Inc.

32 Wells Street **Buffalo, N. Y.**

Chapman Double Ball Bearing Co., Ltd., 339-351 Sorauren Ave., Toronto, Ont.



Figures lose their dryness when they have a direct bearing on your purse.

A 7-inch phosphor bronze pulley bearing, finished, ready to install on a 2 3-16 inch countershaft, had been costing one of our clients $8.11.

They replaced it with an **Arguto Oilless Bearing** at a cost of $1.24. The cost of installing was the same for each, $1.62.

Three bronze bearings had previously been required every year.

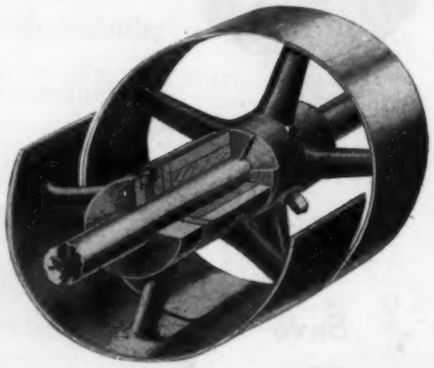
At the end of 4½ years the **Arguto Bearing** was still in service and the cost figures were as shown.

The really big saving was indirect—the elimination of **Loss** of **Production** during shut-downs.

There were other savings—a letter will bring you full details.

Bronze		Arguto
$8.11	cost of bearing	$1.24
$1.62	installation .	$1.62
$9.73		First cost, $2.86
3 a year		
$29.19	cost per year	
4½ years		
$131.35		Direct cost, $2.86

Net direct saving per bearing, $128.49



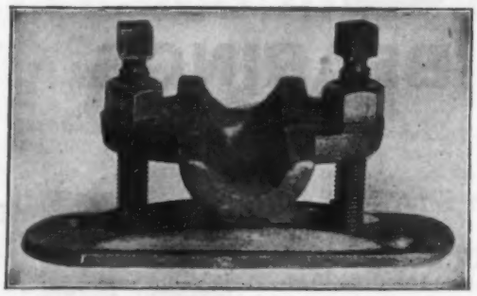
Arguto

Outwears The Best Bronze Metal

Smoother than Grease

Arguto Oilless Bearing Co.
148 Berkley Street, Wayne Junction,
PHILADELPHIA.

DAY Adjustable Rocker Shaft Bearings



No. 1 A. Patented Oct. 26, 1915.

THIS is just a common sense attachment that has not failed to satisfy a single mill.

Your rocker-shaft troubles will be over when you equip your looms with Day Adjustable Bearings. They will save you the cost of a new rocker shaft for all time, reduce seconds and thin places, save in supplies, break-outs, and in many other ways.

As one Georgia mill superintendent wrote us,

"Any practical mill man who will test these bearings, will find at least twenty different ways in which they will keep the loom in better shape and increase production. I would advise any mill man to try these bearings and be convinced of the merit of it, like I have been."

This man equipped his 1820 looms with Day Adjustable Bearings.

Any of the many mills using them will tell you about their many advantages.

Let us send you a pair for trial. State kind of loom. Write today.

Textile Specialty Company
(*Formerly Day Adjustable Bearing Company*)
GREENWOOD, S. C.

USE THE COUPLING SYSTEM OF ROPE DRIVING

This coupling is for use on the English system rope drive and controls all stretch of the individual ropes in this system.

Hunt Coupling ready for use.

You can shorten the ropes at any time by simply twisting the coupling, which twists up the strands of the rope and maintains the original rope diameter.

The shortening is done with the rope in position on the pulleys and all splicing costs and delays are avoided.

Ask for catalog W-15-1 giving full information.

C. W. HUNT CO., Inc.,
WEST NEW BRIGHTON, N. Y., U. S. A.
45 Broadway, N. Y. City. Fisher Bldg., Chicago.
Munsey Bldg., Washington.

EFFICIENCY

in the transmission of power to the sewing and stitching machines illustrated resulted in

Greater output
Smaller power bills
Fewer interruptions for repairs
Less wear and tear on machines
Higher limit in the operating speeds
Fewer broken threads
Greatest economy of space
No obstruction of light
No objectionable noise
Mutual satisfaction from piece rates

LINK-BELT
SILENT CHAIN DRIVES

have proved their efficiency in this shoe factory over leather belt drives, both transmitting power under the same conditions. Note the summary of the test in the small panel below. Details are given in Folder No. 277—sent on request. Full information regarding Silent Chain Drives can be found in Data Book No. 125, our 128-page price list. With it you can select drives and figure prices.

LINK-BELT COMPANY

PHILADELPHIA

New York, 299 Broadway
Boston...49 Federal St.
Pittsburgh, 1501 Park Bldg.
Buffalo, 698 Ellicott Sq.
Seattle..576 1st Ave., S.
Minneapl's, 418 S. 3d St.

CHICAGO

Denver...Lindroth, Shubart & Co., Boston Building
Louisville, Ky.....Frederick Wehle, Starks Building
Knoxville, Tenn.....D. T. Blakey, Empire Building
Birmingham..McCrossin & Darrah, Am. Tr. Building
New Orleans....C. O. Hinz, Hibernia Bank Building
Charlotte, N. C....J. S. Cothran, Com'l Bank Bldg.
Toronto, Can.....Canadian Link-Belt Co., Ltd.

INDIANAPOLIS

St. Louis, Central N'tl Bk. Bld.
Wilkes-Barre 2d N'tl Bk. Bld.
Detroit..732 Dime Bank Bldg.
Kan. City, Mo., 407 Finance Bl.
Portland, Ore. 1st & Stark Sts.
Los Angeles, 163 N. Los A. St.
Cleveland, 429 Rockefeller Bldg.
San Francisco..461 Market St.

Power Transmission Test

Made in Curtis & Jones Co.'s Shoe Factory, Reading, Pa. Operating conditions alike for leather belt and Link-Belt Silent Chain Drives.

3 H. P. induction motor driving lineshaft. Duration of each test run, 61 hours.

Current consumed by leather belt drive - - 80 K.W. Hours

Current consumed by Silent Chain Drive - - 73 K.W. Hours

Saving Made by Silent Chain Drive

7 K. W. Hours in 61-hour test run.

FREADRICH BELTING CO.

MANUFACTURERS OF

Oak Tanned LEATHER BELTING Surface Tanned and Waterproof

LACINGS CEMENTS DRESSINGS

SLABS STRAPS

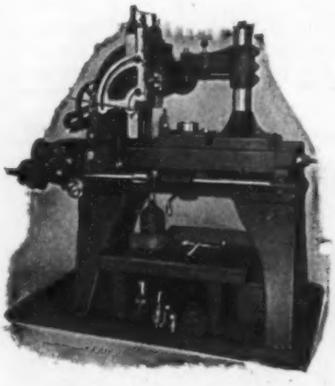
SOUTHERN REPRESENTATIVE M.E. STEVENS 316 PEACHTREE ST., ATLANTA, GA.

St. Louis, Mo.

EXPORT DEPARTMENT NEW YORK, U.S.A.

FULL AUTOMATIC, SEMI-AUTOMATIC and HAND OPERATED

Gear Cutting Machines!



Especially Adapted for Use in

Cotton Mills.

Hundreds Now in Use.

Send for special circulars.

The D. E. Whiton Machine Company

New London, Conn.

Factory Size White Enameled Steel First Aid Cabinet, 14½x27x3, lock and two keys, with handle for carrying should it be necessary.

The above Cabinet is approved by the National Workmen's Compensation Bureau, and State Commissioners.

THE CABINET CONTAINS THE FOLLOWING ARTICLES:

3 Rolls 1½ in. Gauze Bandages
2 Rolls 2 in. Gauze Bandages
2 Rolls 2½ in. Gauze Bandages
3 Rolls 1½ in. Cotton Bandages
3 Rolls 2 in. Cotton Bandages
2 Rolls 2½ in. Cotton Bandages
6 Pieces 6x36 in. Linton Gauze
3 Cartons Absorbent Cotton
3 Cartons 1 yd. ea. Sterile Gauze
2 Cartons Absorbent Lint
1 Box Styptic Cotton
1 Box Styptic Gauze to arrest hemorrhage
1 Box Picric Acid Gauze for burns
8 oz. Bottle Thyptus Antiseptic
8 oz. Phenicric Emollient for burns
8 oz. Bottle Antiseptic Soap
8 oz. Bottle 4% Boratic Acid Sol.—for eye wash and burns
2 oz. Bottle Alcoholic Iodine to prevent infection
1 Bottle Peroxide Hydrogen
1 Can Balsamic Antiphlogistic for rapid healing
4 oz. Bot. Arom. Spts. Ammonia fainting, heart failure, etc.
2 oz. Bottle Castor Oil
4 oz. Bottle Extract Ginger
1 Roll 1 in. x 5 yd. Adh. Plaster
1 Carton Court Plaster
1 Bottle Liquid Court Plaster
2 Tubes 3% Soda & Vaseline
1 Box Wood Tongue Depressors
1 Pair Thumb Forceps
1 Pair Scissors
1 Paper Safety Pins
1 Graduated Medicine Glass
1 Eye Dropper
1 Tourniquet to control hemorrhage
1 Box Kaskola Stomach Tablets
1 Box Pain Relief Tablets
1 First Aid Manual
1 Ready Reference Chart
2 Splints, Assorted Sizes
1 Box Applicators Cotton Wound

SENT FREE FOR 60 DAYS TRIAL

Price complete, $9.50 if you like it. No advance since the war.

THE ACCIDENT CABINET CO. KALAMAZOO, MICH.

CRESSON-MORRIS CO.

POWER TRANSMITTING MACHINERY

PRODUCTION

PRODUCTION logically falls into two general classes—quantity production and quality production. Quality machinery is essential to both.

Thousands of manufacturers have been helped to attain greater output and higher quality through the use of power transmitting machinery bearing the finished perfection mark of the Cresson-Morris Company.

The Cresson-Morris mark is a fifty-eight year testimonial that Cresson-Morris Machinery has successfully overcome the fifty-seven varieties of conditions that the pushing up of production and the pushing down of costs has developed.

It is the business of the Cresson-Morris staff of engineers to anticipate and meet the conditions that may arise tomorrow. They are always at your service.

CRESSON-MORRIS COMPANY

ENGINEERS—FOUNDERS—MACHINISTS

PHILADELPHIA, PENNA.

2066-X

For Four Years

The Bird-Wilcox Co. has been furnishing Oxy-Acetylene Welding Apparatus to the cotton mills of the South.

This Proves:

1. That welding apparatus properly installed, is a saving proposition and a necessary part of a modern mill's equipment.

2. That Bird-Wilcox Co. Apparatus has stood the Test of Time. In the last two years our business has increased 800%.

"A demonstration is a revelation."

BIRD-WILCOX CO., Inc.

Atlanta Chattanooga Charlotte Savannah

99 50/100% PURE

You Can't Afford To Use Impure Welding Gas

Remember that the welding of broken parts in your mill shop cannot be done economically and efficiently unless you are using the purest oxygen gas obtainable. If it isn't the purest, then you're losing money.

The purer the gas, the lower your welding costs. When you use BURDETT OXYGEN, you are reducing your welding costs to a minimum, for BURDETT OXYGEN is 99½% PURE—the best that can be bought anywhere.

There is a Burdett Plant near you.

Save delay by ordering from the nearest Burdett Plant.

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Butte, Mont.
Philadelphia, Pa.
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Burdett Oxygen Co.
and Associated Companies

Chicago
St. Johns Court.

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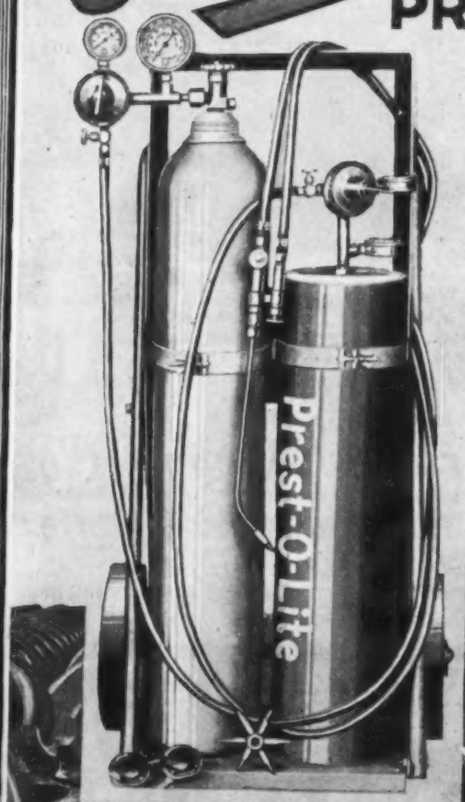
Gas and Electric Building.

BURDETT OXYGEN

"The Best by Test"

Conserve Steel and Iron -Cut Out the Scrap Pile

Prest-O-Lite PROCESS



MILLIONS of dollars worth of damaged or worn metal parts, casting and tools lie rusting in the scrap-piles of American railroads, factories, mines, foundries, repair shops, etc.

By oxy-acetylene welding much of this enormous waste can be eliminated, and losses due to breakdowns—resulting in "tie-ups" of operating equipment—can be greatly reduced.

The Prest-O-Lite Process is ideal for all classes of metal repair work. It handles repairs quickly and efficiently,—often right on-the-spot in cases where dismantling would involve expensive delays—saves time which would be wasted waiting for replacements—helps avoid the "scrapping" of valuable metal parts.

The welding outfit is portable—available at all times for outside work as well as for shop use.

In the manufacture of war munitions, ships, railway supplies, boilers, metal furniture, implements and tools this same process makes possible many striking economies—gives neater, stronger joints at ***less*** cost.

No matter what other welding method you now use, a Prest-O-Lite outfit put to work in your shops will speedily pay you profits. Write for special literature and data--now.

The Prest-O-Lite Co., Inc.
U. S. Main Office, 83 Speedway, Indianapolis, Ind.
Canadian General Office, Dept. A-5 Toronto, Ontario
59 Branches and Charging Plants
World's Largest Makers of Dissolved Acetylene

OXY-ACETYLENE WELDING is not an experiment in the repair shop, but some concerns are still experimenting with inferior apparatus constructed without knowledge and experience of what is required, and poor results are blamed on the process instead of on poor judgment in the selection of apparatus.

The great success of oxy-acetylene welding has been accomplished with DAVIS-BOURNONVILLE APPARATUS, which leads the world in range, efficiency, and number of successful users. It is backed by the longest service and experience, and the greatest development.

DAVIS-BOURNONVILLE CO.

General Offices and Factory, Jersey City, N. J.

Sales Offices in

New York	Pittsburgh	Chicago	Seattle
Boston	Cleveland	Detroit	San Francisco
Philadelphia	Cincinnati	St. Louis	Los Angeles

The superiority of LUNKENHEIMER Cast Steel Valves

is an established fact; proved by the highly satisfactory results which they give under extreme service conditions. In design, they incorporate every detail which engineering practice has shown to be the best.

The material—Lunkenheimer Cast Steel is manufactured by the most improved method and complies with the specifications for steel castings as laid down by the American Society for Testing Materials. The tensile strength averages about 70,000 pounds per square inch.

The castings are annealed before leaving the foundry so as to insure a perfectly homogeneous structure and to relieve all internal casting strains.

The trimmings are made of Monel, Nickel, or Bronze, according to the duty the part performs and the pressure and temperature of the steam carried.

The workmanship is Lunkenheimer "Quality."

Install LUNKENHEIMER CAST STEEL VALVES for continuous satisfactory service.

Globe, Angle, Gate, Balanced Throttle, Non-return, Pop Safety, Blow-off Valves, etc., for W. S. P. up to 350 pounds and 800° F. temp.

The reason!

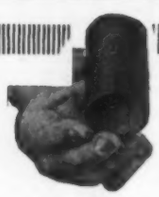
Micro-photograph of LUNKENHEIMER Cast Steel — Micro-photograph of Ordinary Cast Steel

THE LUNKENHEIMER CO.

"QUALITY"

Largest Manufacturers of High Grade Engineering Specialties in the World.

New York Chicago Boston London 15-11-10



Long Life Bushings in Spite of Neglect.

For Efficiency and Economy

Oil-less "NIGRUM" "BOUND BROOK"

(Impregnated Wood) (Graphite-and-Bronze)

Bearings

Trade Mark Reg. U. S. Pat. Off.

You'll never have to stop your machine, due to the neglect of someone to properly oil it, providing you use NIGRUM or BOUND BROOK Oilless Bearings.

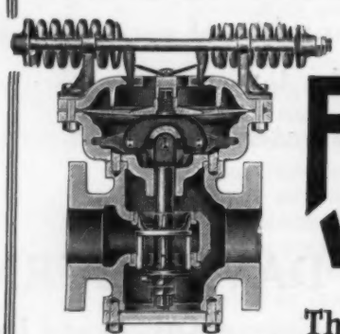
They run smoothly and evenly without oil, grease or attention. They will save you money by saving you oil, and eliminate much of the wear and tear upon the working parts of the machine.

Write for Interesting Booklet, "Oil-less Bearings."

BOUND BROOK OIL-LESS BEARING CO.

10 Church St., BOUND BROOK, N. J.

All Genuine Graphited "Oil-less Bearings" have always been made at Bound Brook, N. J., in the United States of America.



Class "W" Pressure Regulator

FOSTER VALVES

Reliability Their Main Feature

They Give Reliable Regulation and Control—

of steam, water, gas and air pressure.

For absolutely uniform lower delivery pressure, regardless of any variations in initial pressure—there is no better, nor more reliable High Pressure Regulator than

FOSTER CLASS "W"

Get a copy of our catalog and investigate this valve together with Low Pressure Regulators, Non-Return Stop Valves, Back Pressure Valves, Float Valves, Pump Governors, Free Exhaust Valves, Fan Engine Regulators, and other Foster Steam Specialties.

FOSTER ENGINEERING CO.

NEWARK, N. J.

180 No. Dearborn St., Chicago, Ill.
161 Summer St., Boston, Mass.
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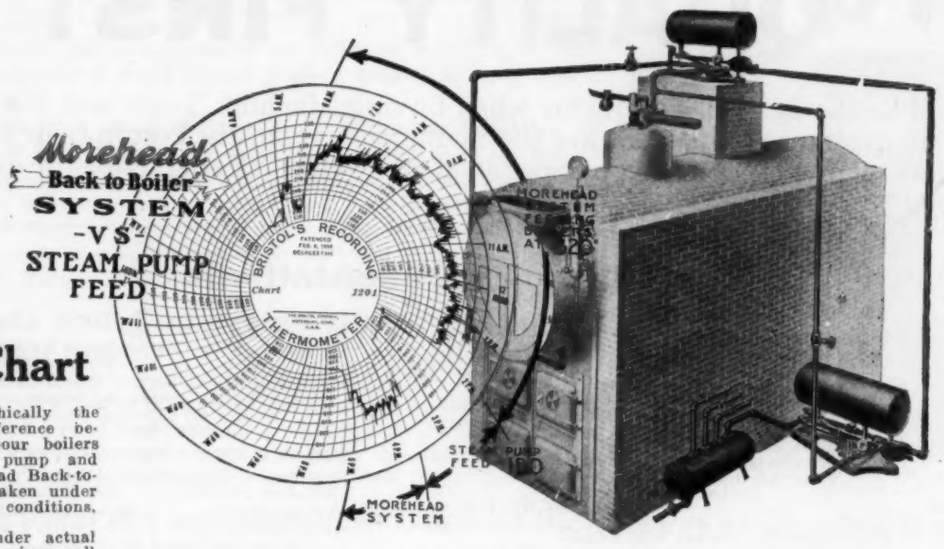

This Chart

illustrates graphically the temperature difference between feeding your boilers with a steam pump and with the Morehead Back-to-Boiler System, taken under exactly the same conditions.

It was made under actual working conditions in a well known Chicago steam plant—and under the personal supervision of Mr. Arthur A. Rice, an unusually capable Chief Engineer of that city.

Feed Your Boilers

PURE HOT WATER

—and Save Coal!

The difference between feeding your boilers with an ordinary steam pump and with the Morehead Back-to-Boiler System is this.

In the case of the steam pump you must let the water of condensation cool down to 212 degrees before the pump can handle it.

With the Morehead System you return the water *immediately* back to the boilers at from 275 to 312 degrees—and save *one per cent of your fuel for every ten degrees increase in heat.*

This Temperature Difference Means a Big Saving in Your Fuel Costs

The hundreds of textile mill operators who use the Morehead System not only find that they are getting better circulation of steam through their steam heated machines—but also that they are saving a large per cent of their fuel.

Morehead engineers will be glad to explain to you in more detail just how the Morehead System may be applied to reduce fuel expense in your own plant. For complete particulars address

Morehead Manufacturing Company

Cotton Mill Dept.

Detroit, Michigan

QUALITY FIRST

Should be the determining factor when buying Machine Tools and Mill Supplies. The companies we represent are the manufacturers of the best in their line—assuring best quality—backed by our personal guarantee, "Satisfaction in every transaction."

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Lodge & Shipley Lathes
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E. O. Partridge Emery Grinders
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Greenerd Arbor Presses

Bullard Boring Mills and Vertical Turret Lathes
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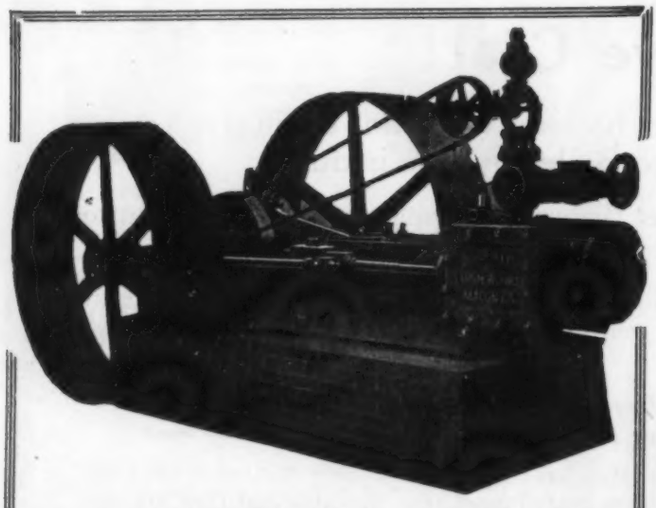
Machine Tools---Mill Supplies---Foundry Equipment

38 West Alabama Street Atlanta, Georgia

"Quality is Economy"

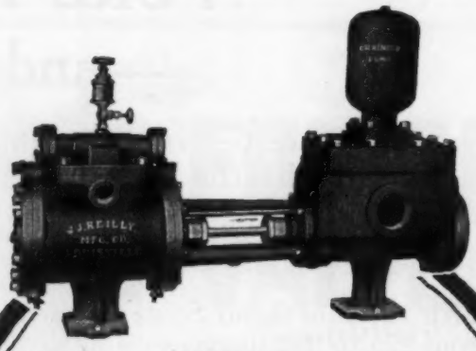


J. S. SCHOFIELD'S SONS CO., Macon, Georgia

MANUFACTURERS OF

High Pressure Return Tubular Boilers, High Grade Stationary Steam Engines, Tanks, Stacks, Stand Pipes.

Heavy Castings and Wrought Iron Works.



When It Comes to Pumps

you will find that Grainger Pumps are built to give satisfaction first and last.

Every Grainger Pump is built according to approved engineering principles and tested to its full rated capacity before leaving our plant.

There is no guess work in the construction of Grainger Pumps. **We know** that every Grainger Pump is right before shipping.

We Solicit Your Inquiries

J. J. REILLY MFG. COMPANY,
Incorporated
121 North 10th St., Louisville, Ky.

Grainger Pumps

BETZ FIRST AID AND ACCIDENT CABINET $7.75

Recognized as the most complete and practical outfit of its kind. Endorsed by Industrial Surgeons and Welfare Bureaus in every section of the country.

This cabinet is a small and compact arrangement, containing all necessary First Aid supplies and may be easily carried about the factory or hung on the wall. The cabinet is made of heavy sheet steel, finely enameled. It is built to hold standard containers of various supplies, including individual racks for bottles in the lower shelf. This is a feature found only in the Betz First Aid cabinet and its value is evident as it prevents the bottles from tipping, breaking or spilling.

Complete and Comprehensive Directions

For First Aid are furnished with each cabinet, being pasted on the inside of the door and in addition an authoritative First Aid Manual is included. With the aid of these directions it is easy to train and teach workmen how to apply intelligent First Aid pending the arrival of the Doctor. The directions are so clear and plain that the ordinary lay person can easily grasp the instructions.

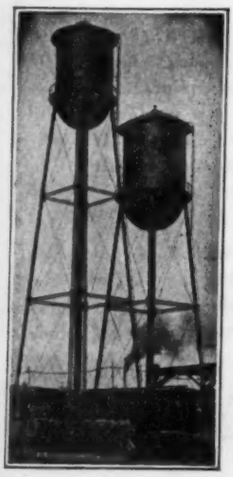
The Betz First Aid and Accident Cabinet includes the following Supplies:

9-1 inch Gauge Bandages,
9-2 " " "
3-3 " " "
4-2 oz. Pkg. Absorbent Cotton.
24 Picric Acid Gauze Pads, (for burns)
6 Pkgs. Plain Gauze,
1 Roll Z. O. Adhesive Plaster,
1 Tourniquet,
1 pr. Dressing Scissors,
1 pr Thumb Forceps,
12 Wooden Tongue Depressors,
6 Cotton Applicators in glass tube,
1 Eye Dropper,
Safety Pins, assorted sizes,
12-12 inch Applicators,
1 Medicine Glass, graduated,
1 Eye-Cup or Douche,
1-2 oz. bottle Boric Acid,
1-2 oz. bottle Alcoholic Iodine,
1-2 oz. bottle Aromatic Spirits Ammonia.
1-2 oz. bottle Jamaica Ginger.
1-2 oz. bottle Castor Oil.
2-3 oz. tubes Burn Ointment.

2X4600. Betz First Aid and Accident Cabinet, complete with supplies as listed above only $7.75

FRANK S. BETZ CO., Hammond, Ind.

TOWERS and TANKS That are Built Right



Boilers,

Structural Steel Work

Sheet Steel and Plate Work

Boiler Tubes, Castings, Etc.

Tell us what you want and let us quote prices.

The Walsh & Weidner Boiler Co.
Chattanooga, Tenn.

Fire! Fire!

Has that alarm ever made a cold chill run up your back? Did you get an instant picture of your plant burnt to the ground?

If not, then you've got something coming to you. **Are you prepared?**

A cotton mill fire is the hardest kind of fire to put out after it gets started. Are you prepared to quench it before it gets started?

Insurance companies recognize

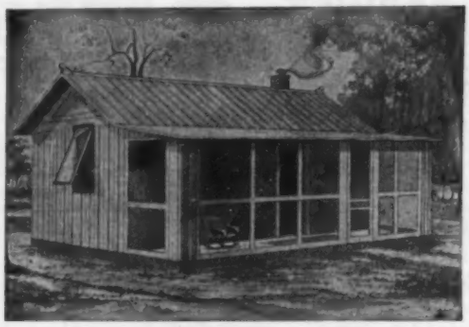
ACME FIRE EXTINGUISHERS

as mighty valuable fire preventers, and any company will reduce your fire insurance rates if you install them. The Acme Extinguishers are examined, tested and labeled under the direction of the Underwriters' Laboratories, Inc.

If you do not have Acme Extinguishers in your mill, remember that an ounce of prevention is worth a pound of cure, and write today for our literature.

Missouri Lamp & Mfg. Company

St. Louis, Mo.



Men Comfortably Housed

are more productive, happier and contented.

Ready-Bilt Steel Portable Cottages

will solve your housing problem.

They are quickly and easily erected,—they are strong, fire proof, durable and comfortable. All parts sectional and interchangeable. Easily moved.

We specialize in Portable Garages, Warehouses, Store Rooms, School Houses, etc.

Whether you need a portable steel building immediately or not write *now* for details. Learn about Ready-Bilt Economy.

The Canton Metal Ceiling Co.

1961 Harrison Ave., S. W., Canton, Ohio

The Fountain Is Cork Jacketed 15 1-2 Coils of 1-2 in. Brass Pipe and Keith Bubbler; Capacity Continuous Line of Users.

A GOOD DRINK ICE COOLED

Drink right from the fountain without cups or contamination. The water is cooled as it flows from the municipal supply pipe through the cork-jacketed ice tank to the Keith Bubbler.

One supply of ice lasts through the hottest day and cools all the water ever required.

Everybody like the bubbler because it's sanitary.

GET OUR CATALOG

Send for our complete catalog, showing our Wash Bowls, Metal Lockers, All Steel Stools and Chairs with Inset Wood Seats, Stock Storage Racks, Metal Shelving, Metal Vault Fixtures, Improved Soda Kettles, 40 and 60 gallons, Water Heaters and Instantaneous Mixers, Bubbling Drinking Fountains, Work-Benches and Bench Legs, Drawing Stands, etc.

Attach to Municipal Supply

Manufacturing Equipment & Engineering Co.

136 Federal St., Boston, Mass.

Address all communications to Framingham, Mass.

How Do You Deliver Drinks?

The accessibility of clear, cold drinking water and the way it is supplied to the workmen is a matter of extreme importance to every manufacturer. Consequently, hundreds of plants are today equipped with the most modern and economical solution to the problem. If doing this had not proved profitable, these concerns would again be using old cup and hydrant methods. But they are not. Many are placing further orders. They have learned the practical results produced by

R. & S. FOUNTAINS

Write for Catalog.

RUNDLE-SPENCE MFG. COMPANY

Milwaukee, Wis.

What About Your Mill Office?

IS your office just a plain "cotton factory" office with worn-out furniture and inefficient filing systems, etc? Or is it a modern "Textile Mill" office, with up-to-date office furniture and "easy of access" filing systems—an office that has a brisk, business-like look to it?

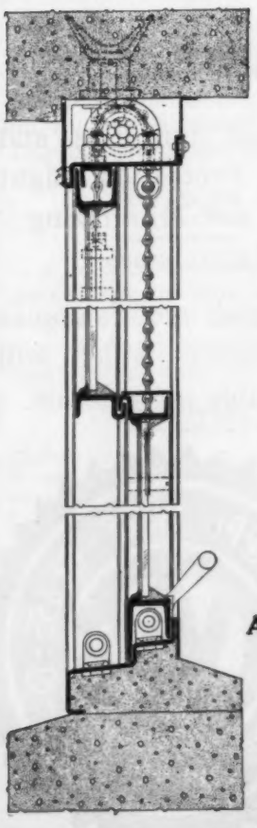
Let us make your office up-to-date. We carry everything for the mill office, —desks, chairs, tables, Globe-Wernicke filing cabinets,—anything that is used in an office.

Our Prices are Right— Our Service is Prompt

Baylis Office Equipment Company

Atlanta, Ga.

Efficient Daylighting
Natural Ventilation



The room is stuffy, and he wants fresh air. To get it, air must go **out** at the top as well as **in** at the bottom.

But does he understand that? No!

The bottom sash looks as good to him as the top, so he opens it and doesn't touch the other.

Here's where

LUPTON STEEL SASH
COUNTERBALANCED TYPE

comes in. Top and bottom sash are hung on one pair of pulleys; as one goes **up** the other goes **down.** Your workman ventilates the shop in spite of himself.

Lupton Steel Sash, Counterbalanced Type is recommended for mills and factories for the following reasons:

1. **It gives equal top and bottom ventilation**
2. **Its large lights are easy to clean**
3. **Being vertical, it collects no dust**
4. **It does not project into the room**
5. **It does not interfere with shades and screens**
6. **It avoids the jail-like appearance of small lights**

Shall we send the No. 9 catalogue?

DAVID LUPTON'S SONS COMPANY

Amber St., & Allegheny Ave.
Philadelphia, Pa.

LUPTON PRODUCTS

Lupton Steel Sash
- Pivoted Factory Type
- Counterbalanced Type for factories
- Counterweighted Type for offices
- Power House Type

Pond Continuous Sash for Pond Truss, sawtooths, monitors and side walls
Pond Operating Device for long lines of sash
Lupton Rolled Steel Skylight
Lupton Steel Partition and Doors
Lupton Steel Shelving

THIS FENCE WILL PROTECT YOUR PROPERTY

ANCHOR POST FACTORY FENCES

of Chain Link Woven Steel

form an unclimbable and practically indestructible factory enclosure.

They are protecting Government property and Industrial Plants in every part of the country and are the accepted standard by which all other fences are judged.

Anchor Post Fences not only provide perfect protection, but are also an economy as their long life and low upkeep more than offset their slight additional cost.

CATALOG. Our Catalog is a text book on modern factory fences, and contains much valuable data upon the subject. We will be glad to send a copy promptly .

ANCHOR POST IRON WORKS, 11 Cortlandt St., So., 13th Floor NEW YORK

Philadelphia Cleveland Boston Hartford Newark

2175-G

MISSISSIPPI WIRE GLASS

Postex Cotton Mill, Post, Texas

is installed for Fire and Breakage Protection, Light Diffusion and Minimizing Cost of Maintenance.

Let us mail you samples and literature which will give valuable information.

MISSISSIPPI WIRE GLASS CO.

217 5th Ave.

NEW YORK.

7 W. Madison St., Chicago, Ill.

4070 N. Main St., St. Louis, Mo.

The Largest Mills Use

Pee Gee

INDUSTRIAL PAINTS

Paint-wise mill-owners and superintendents prefer Pee-Gee Paints. There is no guess work about them, for they are made to meet the special requirements of Mills and Mill Villages.

Pee Gee FACTRILITE
THE LIQUID DAYLIGHT

For Interior Walls and Ceilings

is made by our own perfected process of especially prepared white pigments and long oil, therefore it will not turn yellow like ordinary paints which contain lead and varnish. It is an economical paint, because it is **Washable, Durable, Germ and Moisture Proof.** Saves the expense of frequent repainting, does not peel or crack and withstands the vibration of heavy machinery. Pee Gee Factrilite has a high-gloss, tile-like finish of highest reflective power, thereby increasing the hours of daylight. **It stays white for years.**

Pee Gee Mill Village Paint

is a double-pigment paint, and contains a **high percentage of Zinc,** notwithstanding the high cost of Zinc. It is the unadulterated combination of finest pure White Lead, ZINC-OXIDE and genuine Linseed Oil in correct proportions.

Pee Gee Mill Village Paint lasts longer, covers more surface, looks better than any other paint. It is guaranteed to be **absolutely pure and free from any adulterations.**

SOME OF THE MILLS USING PEE GEE PAINTS

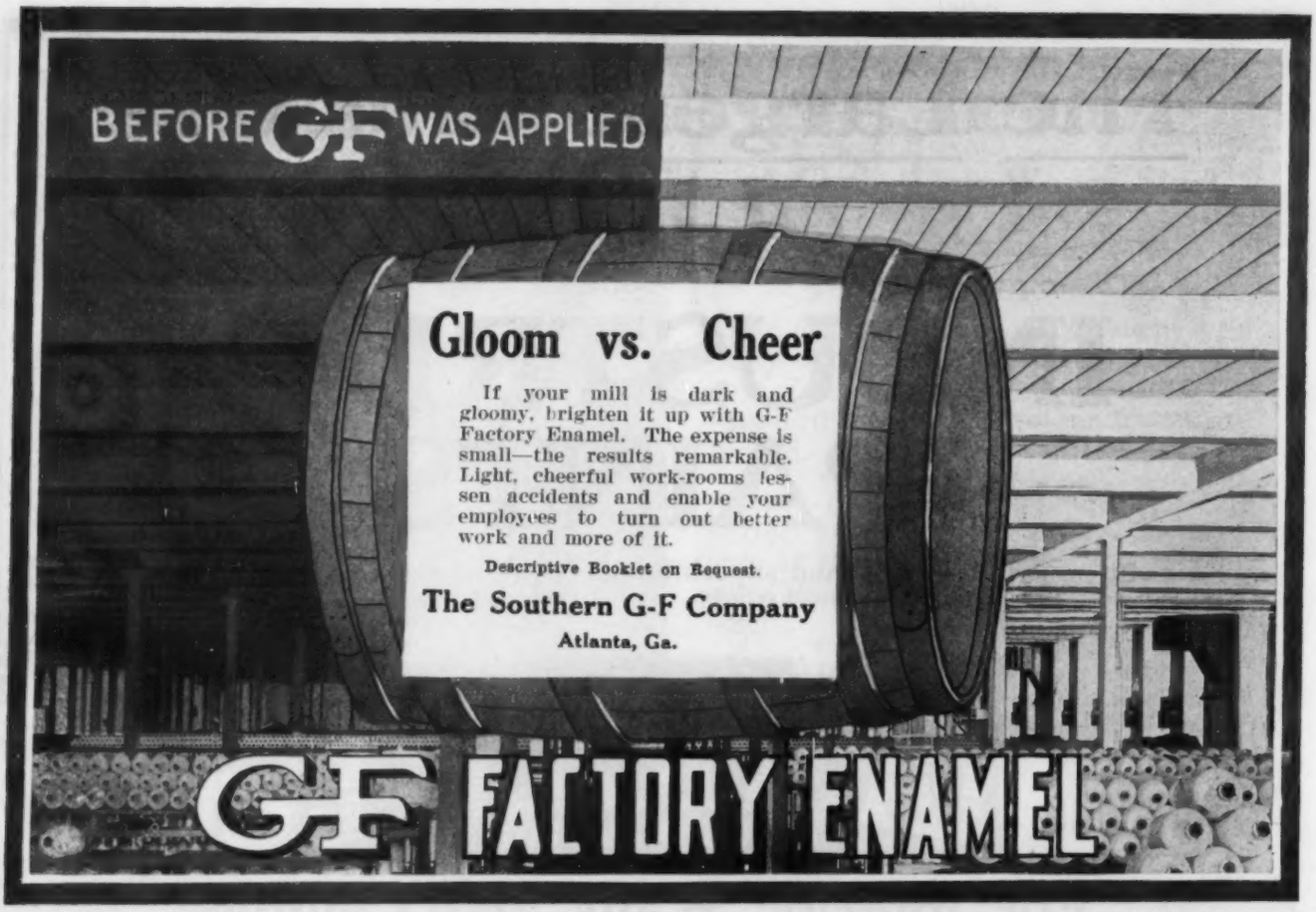
Gaffney Mfg. Co.	Gaffney, S. C.	Mayes Mfg. Co.	Mayworth, N. C.
Woodside Cotton Mills	Greenville, S. C.	Loray Mills	Gastonia, N. C.
Brandon Mills	Greenville, S. C.	Manchester Cotton Mills	Manchester, Ga.
Cabarrus Cotton Mills	Concord, N. C.	Alexander City Cotton Mills	Alex. City, Ala.
Imperial Cotton Mills	Concord, N. C.	Merrimack Mfg. Co.	Huntsville, Ala.
Holt-Granite Mfg. Co.	Haw River, N. C.	W. A. Handley Mfg. Co.	Roanoke, Ala.
Dakotah Cotton Mills	Lexington, N. C.	Buck Creek Cotton Mills	Siluria, Ala.
Nokomes Cotton Mills	Lexington, N. C.	Travis Glass Co.	Clarksburg, W. Va.
Clinchfield Mfg. Co.	Marion, N. C.	W. Va. Pulp & Paper Co.	Piedmont, W. Va.
Clyde Cotton Mills	Newton, N. C.	Va. Woolen Co.	Winchester, Va.

We supervise the job at our expense and place at your disposal a practical man to direct the painting of your mill or any part thereof.

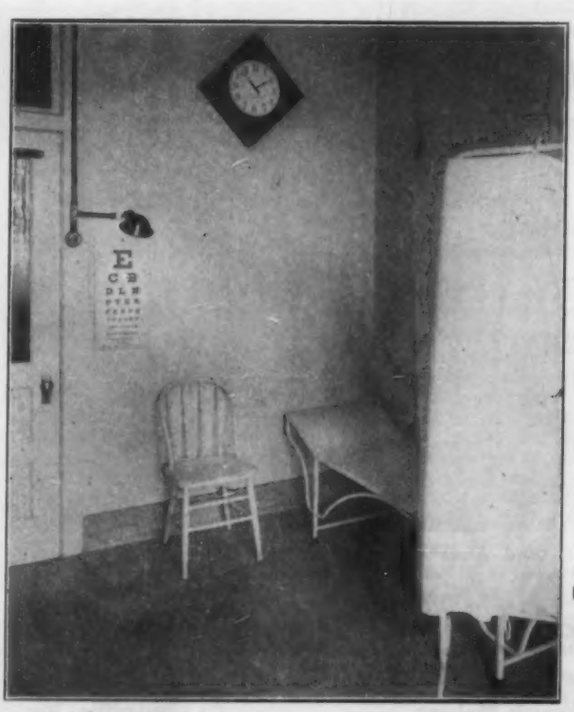
Peaslee-Gaulbert Company

Incorporated

Established 1867. **Paint Grinders, Varnish Makers.** **Louisville, Ky.**


BEFORE GF WAS APPLIED
Gloom vs. Cheer
If your mill is dark and gloomy, brighten it up with G-F Factory Enamel. The expense is small—the results remarkable. Light, cheerful work-rooms lessen accidents and enable your employees to turn out better work and more of it.
Descriptive Booklet on Request.
The Southern G-F Company
Atlanta, Ga.
GF FACTORY ENAMEL

Be Sure to Finish Your First-Aid Room With



Upco QUALITY

"Since 1881"

Not only has Upco Porcelain Enamel proved its superiority as a mill white, but it is now being used for finishing walls and ceilings of first-aid rooms in many mills. The picture shows the Joseph & Feiss Company's first aid room finished with Upco.

The many mills that already have a first-aid room, or are thinking of installing one, should remember that Upco is the ideal wall finish—that it is absolutely sanitary and will remain snowy white no matter how often washed.

Ask today for our booklet "Light Without Power."

The Ullman-Philpott Co.

Industrial Paint and Varnish Laboratories

Cleveland, : : : Ohio

Knack or Knowledge —or BOTH?

YOU'VE got to go back of the color panel to find the pedigree of paint. In these days, when white is the only acceptable covering for the inside of a factory, the prime question about that covering is—will it *stay* white? Next—will it stay *on?*

If it cracks, flakes, peels or blisters, it's no good. If it turns yellow, gray or in any other way departs from white, it loses efficiency value for every slight degree of change.

The time to find out the character of coatings is before you put them on the walls.

ARCO-RAYS
"LENGTHENS YOUR DAYS"
TRADE MARK

It stays white and it stays on

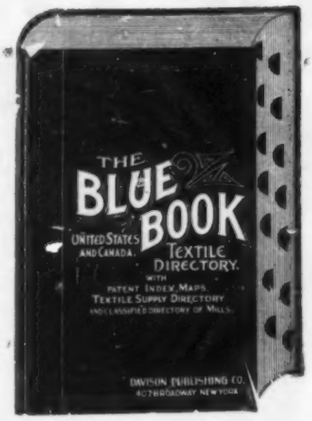
Arco Rays is an interior white coating that stands every test for quality.

Applied with a brush, Arco Rays eliminates deep shadows, accidents, spoilage, waste and eye strain; it increases production. It may be washed with soap and water. It sheds dust, is sanitary, clean and free from glare. Its use will make an immediate improvement in working conditions in any factory and will reduce the cost of illumination. For concrete, stone, wood or brick, Arco Rays is the most economical interior coating on the market because of its vital whiteness.

Our chemists have studied every ingredient ordinarily employed in paint manufacture and selected only those that are dependable. Beyond that they have developed special technical processes for the treatment of the oils to eliminate yellowing. To complete the service, Arco Rays is made by men who know every knack of hand and eye that counts for quality in the product.

Write for our Booklet containing the reasons why, and valuable information on efficient interior coatings for all types of factories.

THE ARCO COMPANY
1199 Wise Building, Cleveland, Ohio
Makers of high grade paints, varnishes and enamels.
Established 1880.



Supreme

WHEN YOU USE THE TEXTILE BLUE BOOK, YOU SHOW EXCELLENT JUDGEMENT. ONE THOUSAND ADVERTISERS IN A GREAT VOLUME OF FOURTEEN HUNDRED PAGES REVEAL, IN OUR JULY 1917 ISSUE, ABSOLUTE PRECEDENCE AND PROVE

Davison's Textile Blue Book

IS THE

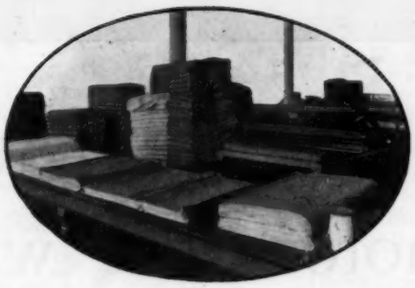
Dominant Textile Directory

Have You Ordered Your Copy of the 30th Annual Edition Just Issued?

Davison Publishing Co.

50 UNION SQUARE—NEW YORK

Dark Hour Difficulties



IN NINETY-NINE out of every hundred textile mills the inspection process is always more or less troublesome. Many managers find the maintenance of uniform quality under natural and artificial light one of the most difficult of their manufacturing problems.

With the approach of fall and winter when artificial light must be relied upon to a much greater extent the difficulties of inspection are considerably increased.

The need for an illuminant that will approximate daylight color values then becomes a necessity if the standard and rate of production is to be maintained.

This problem has been satisfactorily solved in many mills by the Westinghouse Mazda C-2 Lamp.

This unit meets the demand for a standard lamp giving light of a daylight quality—a lamp that can be used with existing fixtures and glassware.

A small grease stain will show up plainly under Westinghouse Mazda C-2 Lamps, whereas a spot of this sort will often escape detection when inspection is made under ordinary illuminants.

In the matching of colors and the grading of textiles these lamps also meet the necessary requirements in a highly satisfactory manner.

There are likewise numerous other processes of manufacture in the textile industry where an installation of Westinghouse Mazda C-2 Lamps will result in both a quality and quantity production increase.

Our Service Departments will show you how to solve your dark hour difficulties.

Westinghouse Lamp Company

165 Broadway, New York

Sales Offices and Warehouses Throughout the Country

GUARANTEED BY THE NAME

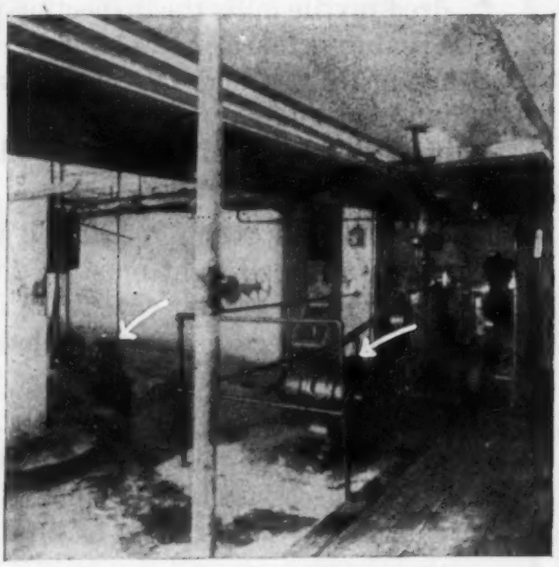
LINCOLN MOTORS

Pump Motors

The motor that will run under water is the best motor for pump service.

The insulation of Lincoln Motors is proof against the water, oil and chemical or alkaline solutions that a pump is called on to handle.

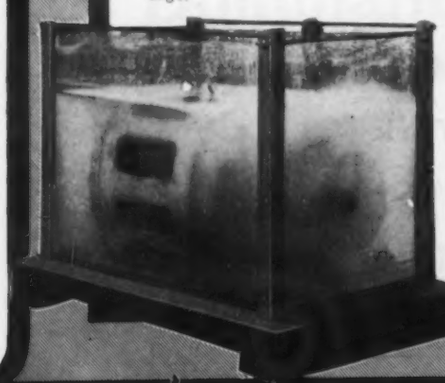
This insures continuous reliable operation of the pump under severe conditions.



Lincoln motor driving pump 24 hours per day under severe moisture conditions.

Write for Bulletin on Motors No. 101-N

This standard Lincoln Motor has operated under water for three years without damage to windings.



"Link Up with Lincoln"

The Lincoln Electric Company

Cleveland, O. **Charlotte, N. C.**

New York City (Singer Bldg.) Columbus
Philadelphia Pittsburgh Buffalo
Chicago Detroit Toronto, Canada

Agencies in other principal cities

The Heart of an
ECONOMY
renewable cartridge
FUSE

is the "Drop Out" Renewal Link. It is the only thing you have to replace in order to renew a blown ECONOMY FUSE. The expense is trifling, compared to the utter extravagance of discarding an entire fuse after it has operated.

Use Economy Fuses in your plant and by their use cut yearly fuse maintenance bills a full 80 per cent.

Write for free Samples. Test them. Let the results speak for the economy and safety of Economy Fuses. Be sure to ask for Catalog 39.

Economy Fuse & Mfg. Co.
Kinzie and Orleans Sts.,
CHICAGO.
At Leading Jobbers.

MOTORS
FOR
EVERY SERVICE REQUIREMENT

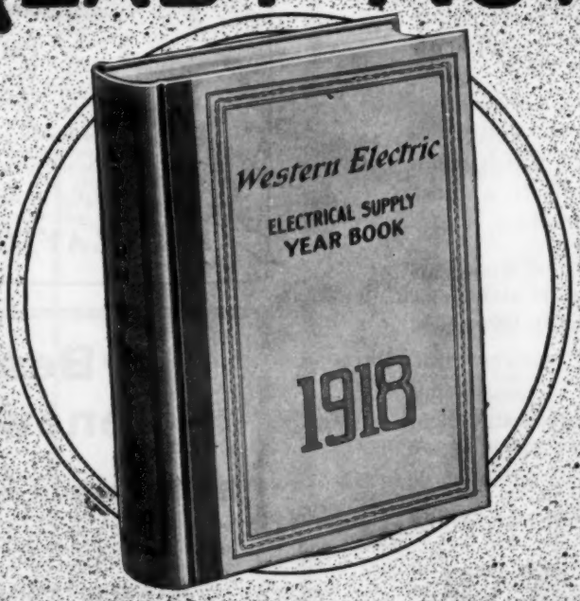
In practically every industry where power is used Allis-Chalmers Motors are today in successful operation.

These motors have been applied to almost every well known make of machine.

Our experience as a pioneer in the application of motors for individual drive and that gained during a quarter of a century devoted to the design, building and commercial application of motors of all kinds will be of inestimable assistance in the selection of motors adapted to your particular service requirements.

Allis-Chalmers Mfg. Co.
Milwaukee, Wis.
Sales Offices in All Principal Cities

READY NOW



The annual buying-guide of the electrical industry.

One uniform set of list prices—one basic discount.

Mail the coupon to us if your copy fails to reach you.

Western Electric Company
INCORPORATED
Offices in all principal cities.

Western Electric Company
195 Broadway, N. Y.
Please send us our copy of the 1918 Year Book

C

The Eyes Have It

Scientists discovered long ago that green is the most soothing light for the eyes.

It is restful, quieting, and causes none of the discomforts which obtain from improper reflection, so green glass has been employed as the most satisfactory means of shading the light which concentrates the rays on your desk.

Mind you, though, it is not the ordinary kind of green glass, for that would not reflect. This shade has an opaque lining, furthermore, it is so shaped that it gathers the light rays and concentrates directly on your work, never coming in contact with the eyes.

So, the eyes have it, the full benefit of the light, and that which penetrates the shade produces a most pleasing and soothing effect.

We have desk and table lamps for every imaginable use, and in various kinds of metal, which you, Mr. Office Man, should know more about.

Furthermore, we have a complete line of electrical supplies and apparatus, right at our finger tips which can be despatched on the shortest notice.

Ask for our 800 page illustrated catalog.

CARTER ELEC. CO.
72 N. BROAD ST.
Atlanta, Ga.

Where Quality and Prompt Service Count—

Your electrical equipment is of paramount importance in the efficient and continuous operation of your mill. Reducing the quality to get a cheaper installation is like cutting down the size of timbers or walls to build a cheaper building.

You can't afford to experiment with your electrical equipments. It's best to consult experts—call on us.

Walker Electric & Plumbing Company
Plumbing, Heating and Electrical Contractors
ATLANTA, ROME and COLUMBUS, GA.

T. H. McKINNEY
INC.

CONTRACTING ELECTRICAL ENGINEERS
ATLANTA, GA.

The quality of your Electrical Installation should be considered as equal in importance to the efficiency and design of your machinery.

We specialize in Textile Mill and Village Lighting. We are glad to furnish estimates on request.

over the entire mill. All electrical wiring etc. to be done by J. M. CLAYTON, Atlanta, Ga.

Put This in Your Specifications

and be assured that the wiring of your mill is done right and all lights and electrical equipment installed correctly by experts who specialize in textile mill electrical work—a concern who has wired and installed equipment in such mills as Fulton Bag & Cotton Mills, Bibb Mfg. Co., Texas Cotton Mills, Thomaston Cotton Mills, and scores of other big textile plants.

We will be glad to furnish estimates on any electrical work in the mill or mill village, large or small. May we serve you?

J. M. CLAYTON, *Electrical Contractor* ***Atlanta, Ga.***

Best Grade Renewed Lamps

Both Carbon and Tungsten Types

We guarantee you most for the money

BOSTON ECONOMY LAMP DIVISION
National Lamp Works of General Electric Company
Maple St. DANVERS, MASS.

The approved illumination for color work in weaving and inspecting rooms

Some of the Uses for MAZDA C-2 Lamp in the Textile Industry

Over looms where colored fabric is being woven, carpets, cloth, neckwear, silk or knit goods; in inspecting and burling rooms; in assorting and boxing and packing rooms; or any place else where colored fabrics are being handled and artificial light is necessary.

GRADING and matching cotton on dark days or at night can now be done very accurately where Edison MAZDA C-2 Lamps are installed. These Edison MAZDA Lamps are the latest development in lighting for work where color matching is essential in manufacturing processes.

In silk mills, in both weaving and inspecting rooms, Edison Mazda C-2 Lamps fill a long-felt need. In the final inspecting rooms where every yard must be examined closely for defects, they insure better and more accurate work by employees.

Every textile and silk mill can use Edison MAZDA C-2 Lamps to advantage. Ask your local electric light company or nearest Edison MAZDA agent to arrange for a tryout in your factory.

EDISON LAMP WORKS of General Electric Co., HARRISON, N. J.

7347

EDISON MAZDA C-2

THE LATEST DEVELOPMENT IN MAZDA LAMPS

COME TO ALABAMA

The South is the place to locate your new cotton mill, where you get production at a uniformly low cost.

Consider What it Means to You

FIRST To use hydro-electric power and be independent of all troubles over fuel supply and fluctuating prices of coal.

SECOND To be able to sign a contract for a period of years guaranteeing your unit cost for power.

THIRD To be in a small town where all your labor is under your direct control.

FOURTH To be practically in the cotton fields and virtually independent of the transportation of raw materials.

Let Us Show You Some Ideal Sites for Your New Mill

Alabama Power Company

120 Broadway, NEW YORK CITY

Brown-Marx Bldg. BIRMINGHAM, ALA.

Building Bigger Business by Better Methods

75% of all electric power used in the textile mills of this country passes through G-E Motors

WHEN you cut down manufacturing costs—up go your profits. When you increase your production—when you increase the quality of your products — when you decrease spoilage—*up go your profits.*

When you make it easier for an employee to produce more, you make it easier for him to *earn* more; and you find it easier to get the *better kind* of help and much easier to *keep* them. *And up go your profits.*

When you cut down your power costs, when you cut down maintenance of plant—when you reduce overhead supervision—wnen you lessen breakage of machinery—when you reduce stoppage of machinery—these mean *more profits.*

These advantages and a greatly increased capacity for service to your customers come to plants equipped with G-E Motor Drive.

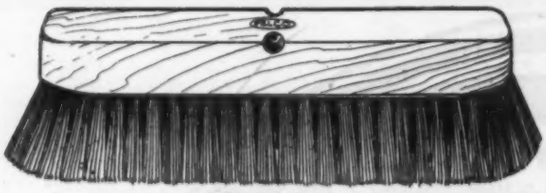
We will gladly send a member of our Engineering Organization who will study the requirements and conditions of your plant, and tell you how, where and why G-E Motor Drive will give you manufacturing advantages.

G-E Motor Drive

GENERAL ELECTRIC COMPANY

General Office, Schenectady N.Y. Mill Power Dept. Boston, Mass.

7028



Floor Sweep

Save You Broom Expense

FELCO

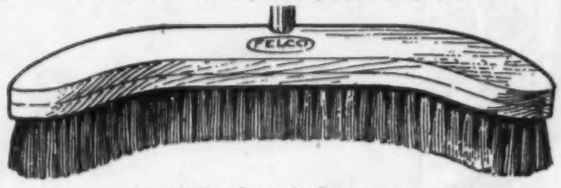
Floor Sweeps will outwear a dozen brooms. Made in any width desired.

Send us a trial order or write for prices.

D. D. Felton Brush Co., Atlanta, Ga.

S. A. Felton & Son Co., Manchester, N. H.

Manufacturers and Repairers of all Kinds of Brushes



Felton Curved Floor Sweep for Spinning Room Alleys

DUCK

SHUTTLES

PROMPT
DELIVERY

SHAMBOW SHUTTLE COMPANY

WOONSOCKET, R. I.

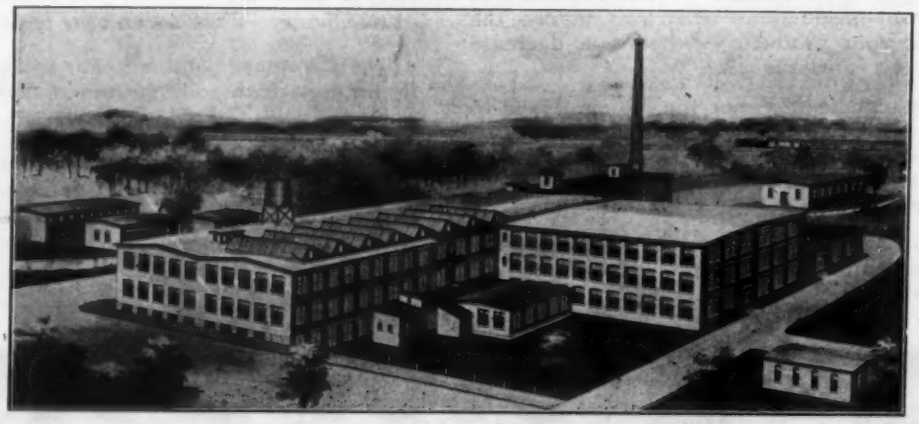
P. B. McMANUS, Pres. and Treas. E. J. McCAUGHEY, Secy. and Mgr.

Home Bleach & Dye Works, Inc.

Established 1881.

Dyers, Bleachers and Mercerizers of Cotton Yarns—in Skein and Warp

Daily Capacity 50,000 Lbs.



PUT YOUR PROCESSING IN OUR HANDS if you want to be sure of results. We have had 35 years of experience in Dyeing, Bleaching or Mercerising and have every modern equipment operated by skilled employees.
Pure Bleaching for Piece Dye Work. Fancy Colors Dyed to Match Samples. Special Finish. Special Dyeing of Cotton Yarns for Silk Goods in Black and Colors.
Also—Facilities for Winding Cotton Yarns on Paper Cop Tubes for the Shuttle, also on Beams and Cones and Parallel Tubes.

Office and Works at Pawtucket R. I.

SEP 19 1917

COTTON

Published Monthly by

W. R. C. Smith Publishing Co., Dalton and Atlanta, Ga.

L. L. ARNOLD, Editor.

Editorial and Advertising Departments, Grant Building, Atlanta, Ga. Subscription price, $1.00 for two years; Canada, $1.00 a year; Foreign, $1.50 a year. Entered at the Dalton, Ga., postoffice as second-class matter.

Contributions to the columns of Cotton are solicited and paid for after publication. The names of contributors need not necessarily be used, but must accompany all manuscripts.

Orders for any change in advertising must reach Atlanta previous to the tenth of the month preceding month of issue, otherwise publishers cannot be responsible for changes.

When changing address, *notify us*, not the postmaster. Always give the old address as well as the new one.

Copyright, 1917. W. R. C. Smith Publishing Co.

Volume 81. **Member Audit Bureau of Circulation.** **Number 11**

This Issue 5300 Copies.

THE BEST RESULTS FROM YOUR MILL.

The agent of one of the largest and most progressive cotton mills in the South recently equipment that is directly of COTTON:

"When I receive my issue of COTTON each month, the first thing I do is to go carefully through the advertising pages, for I find there many new suggestions and much equipment and is directly adaptable to our mill."

The policy of keeping in touch with the most modern equipment and methods applicable to textile mills is no doubt one of the big factors in this company's success.

You may have been running the various departments of your mill or doing your own particular work month after month in the same way believing that you were getting the best possible results. But this is a mighty progressive age and each day sees new labor and time saving equipment put on the market, new methods invented that will enable you to get better results from your spinning room, weave room, dye house, shipping department, office or even your whole mill and equipment.

It is your privilege, in fact your business, to keep in touch with new methods and equipment. You can do it by reading carefully each month the advertising pages of COTTON.

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Read through the advertisements appearing in this particular number, page by page, and see how many suggestions you get that are directly applicable to your mill. You will be surprised at the large number.

Bear in mind that space often prevents the manufacturer from giving you much more than a suggestion of the equipment or service he has to offer you. Practically every manufacturer, however, has catalogues carefully prepared giving you full details on the subject in which you are interested and will gladly send them to you without obligation. Drop them a line for the information you desire.

IN OUR DAILY MAIL.

From a cotton mill in South Carolina:

"We are having trouble with the points on our skewers wearing out. Do you know of a firm making a machine to re-point skewers? Any information you may give will be appreciated."

From a hosiery mill in Georgia:

"Please refer us to manufacturers of waste balers suitable for baling knit goods waste."

From a Southern mill engineer:

"I am in touch with a party planning to start a bag factory. Would appreciate it if you would put me in touch with manufacturers of cutting machines, sewing machines and turning machines suitable for this work."

DIXON'S

Waterpooof

Graphite Grease

is prepared especially for gears, cables, pump plungers and piston rods. The selected flake graphite, blended with the special base, provides the necessary protection for machinery under conditions where ordinary lubricants fail.

Waterproof Grease stays where it is put. It is not affected by water or ordinary temperature changes. Its excellent qualities as a lubricant are available at all times.

It is particularly well adapted for exposed gears, cables, pump plungers and piston rods.

Send for Booklet No. 34-W.

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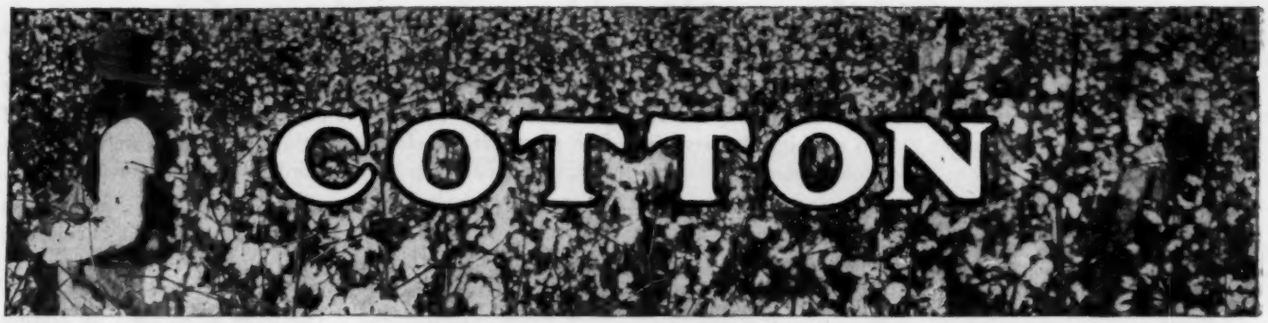


September, Nineteen-Seventeen

Is High Density Compression the Remedy?

"How few think justly of the thinking few; how many never think who think they do."

This quotation is brought to mind by the printed comments of people who have taken "snap judgment" on one of the difficult problems now facing the railroads of the South—the proper movement of the cotton crop to the mills.

The railroads are already loaded to the limit and in many instances are not only double-tracking parts of their trunk lines to facilitate the enormous traffic, but have, in a number of cases reduced the fast express service, thus allowing the abandonment of many local passenger trains in order to release the locomotives so used for freight movement.

In normal times the movement of the cotton crop calls for all the equipment the roads of the South can scrape together in order to prevent undue delays. This year these roads, particularly those of the Southeast, are handling the abnormal industrial traffic brought on by war conditions, to which will be added the transportation to cantonment camps of many thousands of soldiers, with their equipment and supplies, at the very season of the year when the cotton crop must be moved to mills and warehouses.

This situation is so serious that the General Managers Association of the Southeast, representing fifty-seven railroads, not only have their best traffic experts at work upon the problem, but are also holding conferences with business men and Chambers of Commerce throughout the section, urging cooperation in the full loading and prompt handling of cars.

There are 2½ million freight cars in the United States. These have an average capacity of forty tons. The average load put in all cars is only seventeen tons or forty-three per cent of their average capacity. The greatest waste is in box cars. Moreover, the average time consumed in loading and unloading each car each trip is four days. This time must be reduced and the full load capacity of the present facilities more nearly utilized.

The transportation of the cotton crop this year is only one of the many problems before the railroads—but it is a serious problem. Therefore, the suggestion outlined in these columns last month to make 75 bales the standard unit for cotton trading and shipment in the place of the present 100 bale limit should be given careful consideration. It should be remembered, however, that any other practical suggestion is welcome.

Some critics, who view the South and its problems through a reversed telescopic perspective, and whose knowledge of Southern problems and conditions assumes a similar infinitesimal size to the eyes of those who are today facing these problems, object strenuously to this suggested change in the size of the cotton trading unit. One such critic declares it unnecessary, and advocates as a substitute high density compression. Let us consider this suggestion.

A standard 36-foot car will accommodate 52 bales of uncompressed cotton. At the present standard density of 22½ pounds to the foot, which is maintained by various compress companies throughout the South, from 75 to 80 bales may be loaded in a 36-foot car. The desire on the part of the roads to bring this loading to the 100 bale unit of trade at once raised the question of high density compression, and careful investigation brought out some of its related problems.

There seems to have been three devices for producing high density compression; the Churchill "Gadget," the new Nesbitt "Standard" compress, and the Webb high density attachment. Little is heard of the first.

The Nesbitt press is a new style compress and the company has one or two plants in experimental operation.

The Webb high density attachment is intended for use in connection with their regular compresses. The Webb compress is in general use and their attachment is in successful operation in a number of places.

Eliminating the question of possible damage to the fibre by the use of high density presses, a point urged by some and denied by others, and conceding that high density compression will allow a loading of not less than 100 bales in a standard 36-foot car, then, (to use an expression coined by a former congressman) "where are we at?"

The majority of the high density presses installed are located at the ports, because in the past little high density cotton was used in this country, the majority being for export. In fact, it is estimated by men at the head of some of the largest compress companies of the South that the number of high density plants located at interior points could not compress more than fifteen per cent of the crop.

Cotton compressed at the ports in no way aids in solving the railroad transportation difficulties. To be of value to the railroads, high density compression should be located as closely as possible to the point of origin—the gin. As long ago as 1911 COTTON advocated high density gin compression. In 1912, at the close of a campaign which resulted in the sending of Maj. John M. Carson to the South

to investigate the situation for the Department of Commerce, and the submission by him of a report unqualifiedly favorable, the head of a large cotton insurance association said to the writer, "You are working along the right line, young man, but you will never live to see high density gin compression adopted. There is too much invested capital against you."

High density compression may be the remedy of the future, but the problem is a problem of today. There are not enough plants at present installed at interior points to prove of practical value, although every little will help. It is equally impossible to secure the delivery of new equipment to the existing plants in time to aid in the handling of the present crop. Advising the railroads to buy more locomotives and cars to aid in this problem would be equally practicable.

High density compression is not the remedy for the 1917-1918 crop.

Another Lesson in Thrift.

Saving hundreds and even thousands of dollars every year through an analysis of the scrap-pile is not a theory, but an actual demonstration one may meet with in many of the larger machinery plants, factories and mines of the country.

Now that the country is at war and all the departments of the government are calling for conservation of this, that and the other thing, plant owners are thinking twice and scratching their heads, before discarding a broken machine or a partly worn apparatus or tool of any kind. Through the various modern processes of welding—and especially through electrical and oxy-acetylene welding—machines, tools and materials are reclaimed and put back to work earning profits, rather than being sold to the junk man for old iron.

The oxy-acetylene process being simple and comparatively inexpensive to install and operate, has found much favor with plants for conserving machinery and material. It makes possible repair jobs never dreamed of a few years ago. The present high prices for raw material, coupled with the inability to get new machinery within a reasonable time, has sent plant owners scurrying for new processes that will help them keep the profits on the right side of the ledger.

Under the oxy-acetylene process, the combination of oxygen and acetylene produces a heat of 6,300 degrees Fahrenheit, and fuses two pieces of metal, leaving the weld as perfect and strong as the other parts.

The advantage of either the electric or oxy-acetylene processes is that the welding can be done often with the broken parts in place, without dismantling the machine, thus saving valuable time and much extra labor.

An automobile manufacturer in a middle western city found there was a big leak in the making of certain castings, through many castings with only minor defects being thrown aside as worthless. These losses were overcome by oxy-acetylene welding, used to fill up slight holes and in building up parts thinned by careless pouring, all at a cost much less than remelting and recasting.

One concern manufacturing chain belts was handicapped in delivering a rush order because a careless workman, in the roughing of some very large links preparatory to rounding them, took off too much in the rough cut of a number of pieces of the bar steel. As time would be lost in getting a new shipment of steel the oxy-acetylene process was called into play and in a few hours the ruined links were built up again and made perfect, the order being delivered on time.

Another small firm uses the process in filling up gas blow-holes in castings, as well as taking care of shrinkages and other imperfections. An automobile manufacturer rescued a large number of housings for gear shifts which were filled with pinholes. The holes were filled by adding metal under the oxy-acetylene flame which fused the new metal with the old and made a perfect job. To spoil or damage a nearly completed piece of work costs money and where it can be made over at slight cost, means the plugging of another leak.

Many cotton mill managers have found the welding process a friend in need. One such manager in a Georgia mill advises that he paid for the welding outfit in the first thirty days by reclaiming broken parts from the accumulated scrap pile.

To Win the War.

No body of men can get together at the present time without soon discussing the subject of the war, which is uppermost in everyone's mind.

The war is the one dominating factor in the world life and thrusts itself before our thoughts whether we wish it or not. We are in the war at last and will remain in it to the end. Whether it shall be a bitter end or a bright end will depend largely upon ourselves, as it is now our war.

President E. W. Rice, Jr., of the American Institute of Electrical Engineers, in discussing this subject recently declared that there is one false idea which we must abandon. It is a belief among a great majority of our people, who, having no acquaintance with science or engineering, are prone to imagine that this war will be settled quickly by some wonderful new invention, as if by an act of legerdermain; but engineers realize that such a thing is practically impossible. It is so hopeless that it is cruel to permit any such idea to take hold of the American public. Neither is it possible for the war to be settled by the act of some hero or superman. It can only be settled by the united efforts of thousands of men, each contributing his bit. "Team play" in our civil army at home is as essential as in our fighting army abroad.

War calls for supreme sacrifices and the deepest devotion, but it also demands something more difficult to give, and that is work. War may be said to be the personification of work, not only individual work, but especially organized and disciplined work—disagreeable, dirty, heart-breaking, back-breaking, nerve-racking work, but always work. No nation of loafers ever won a war. Other things being at all equal, that nation or people who are willing to work the hardest will surely win the victory. Only relatively few can be useful in the direct service of the army and navy, but there is plenty of honorable work and useful work for us to do. The most effective work for most of us will be in the shops and offices at home, and everyone who does his work loyally and well, is as much a factor in our organized war as is the man at the front.

Coordinating Welfare Activities

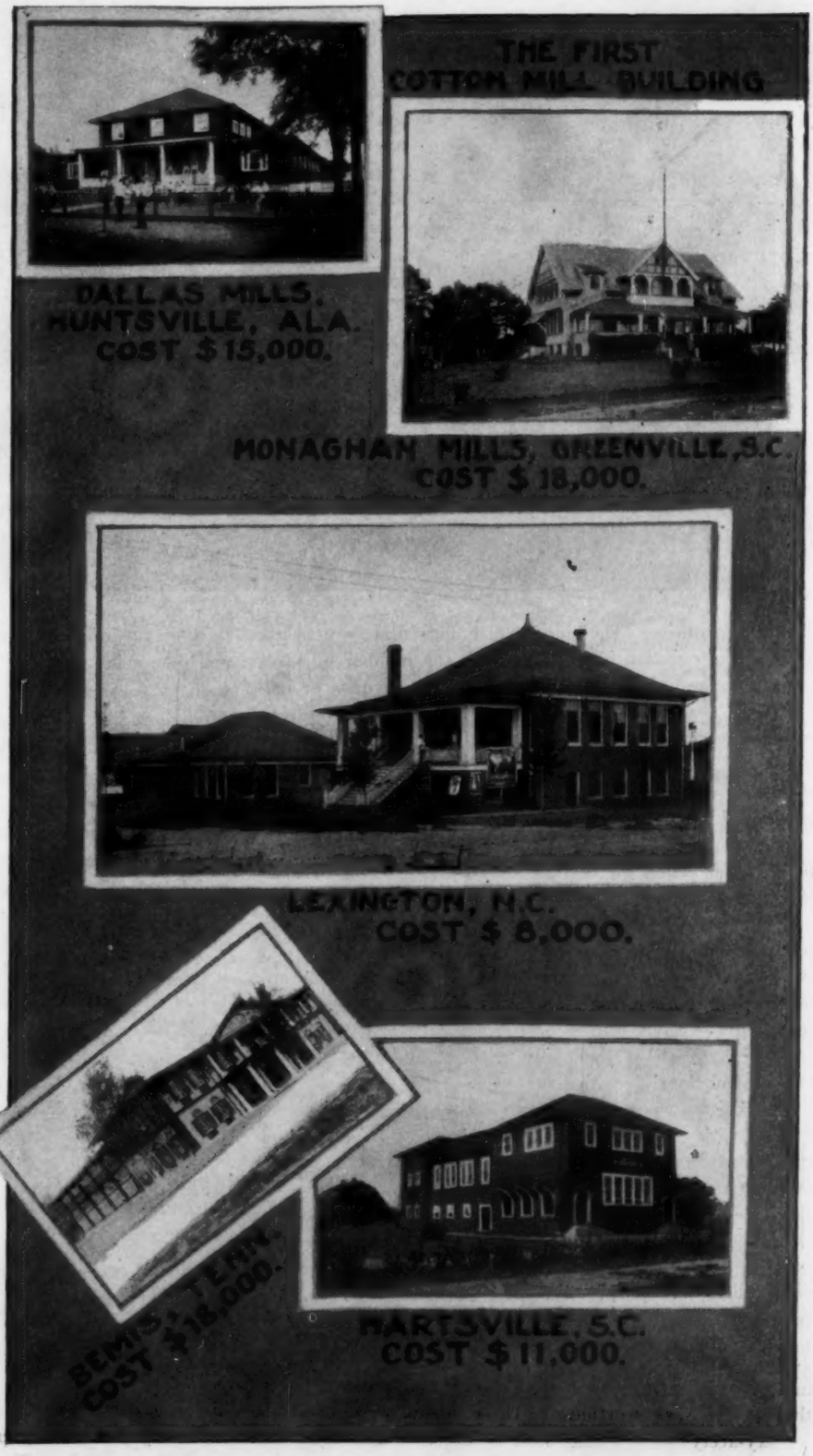
BY G. D. CRAIN, JR.

An interesting development of the work which is generally classified as belonging to employees' welfare activities is the tendency to group under one head and in one department all of the features which pertain to this character of effort. Coordination is bringing about greater effectiveness, and at the same time producing better results for the employee and for the mill-owner.

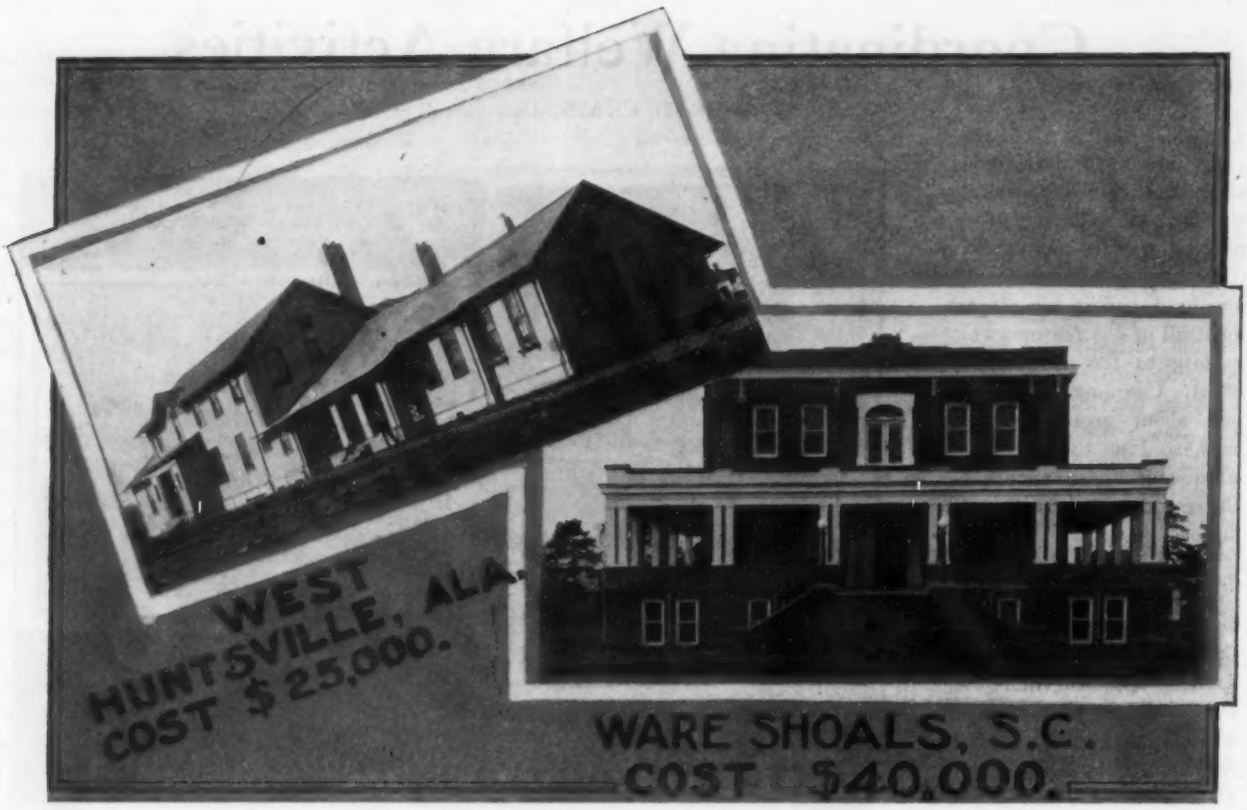
It is worth while to recall that these things had small beginnings, as a rule, and that the development along various collateral lines came as the result of the benefits which were received from the expenditure of a small amount of time and thought and effort. Money, it should be stated incidentally, is needed for such work, but the other things are needed more. In fact, no ready-made, automatic system of welfare activities has yet been devised that will give satisfaction.

The first effort along this general line is usually in the form of a first-aid station, where those who are hurt or become ill while at work may be treated. As a rule the equipment of such a station in the beginning is not elaborate, and no individual is delegated to have charge of it. The idea is that if the hurt is serious enough a physician can be called, and arrangements for "call service" are made with a doctor.

Later on the equipment is made more complete, a separate building is sometimes erected to house it, and either an employee at the plant is trained in first-aid work or a nurse is employed for whole-time service. If the plant is big enough and the work important enough a resident surgeon is employed; otherwise the arrangement for "call service" is continued.



Results along this line are usually good enough to encourage those in charge of the plant to look about for fur-



ther opportunities. The thing which immediately presents itself is the question of cutting down the number of cases of injuries and sickness by eliminating, in advance of employment, those who are defective. This is done by physical examinations, which help the employee as well as the employer, by indicating to the former defects which need attention, and which often have been previously entirely overlooked.

Physical examinations are now the rule in most large plants, even when the work does not involve big hazards. Work in a cotton mill is not considered especially dangerous, but it is highly desirable that nobody be employed who is not in good physical condition. Such a person is not a good investment from a money standpoint or from any other; and in some cases where diseases, such as tuberculosis, are involved, ruling out prospective employees is a protection to all of the other workers, and one to which they are obviously entitled.

Taking up the matter of physical examinations in connection with employment brings the health service and first aid department close to the employment department. These two are thus found to work together advantageously. In fact, they must be coordinated, on account of the frequent necessity for transferring help from one department to another; in other words, suiting the work to the physical condition of the worker. When this is done the mill loses nothing through the unnecesary reduction of the number of hands—which is the first thing those charged with production think of—but on the contrary more and better work is done by placing each employee at a task for which she is suited by virtue of her special condition.

The next thing which impresses the progressive mill-owner is that health and safety are directly related to the condition of his mill; in other words, that sanitation is part of the work of prevention, just as much as guarding machinery is. So the nurse or the company doctor, or perhaps a committee of workers, get together and consider what should be done along this line. It is probably decided that the common drinking cup must go, and bubbling fountains are installed instead. Good plumbing arrangements are provided for, so that employees may wash conveniently at noon-time and in the evening. Closet facilities are increased, and are made adequate and proper. Lockers are installed, giving each employee a place to keep his or her clothing, and encouraging the hands to change their attire in going to and leaving work. The matter of lighting the building will also come before those charged with the general subject of sanitation.

Reference to a committee of employees emphasizes the fact that the biggest and most successful industrial corporations are encouraging cooperation on the part of their operatives. The latter are made to understand that everybody is working for mutual success, and committees are organized to handle safety, sanitation and other features in which the help are interested. Incidentally, since these committees, to do any real work, must have a place to meet, it is usually found that space somewhere in the health service department can be given over to these meetings. This serves a double purpose, since it is always desirable that the employees shall become well acquainted with those in charge of this department, so that in case of sickness or accident they will go at once to them.

Good health is dependent as much on the right kind of food as anything else, and one of the things which employers were slowest to realize was that there should be a proper place for lunches to be eaten. Though in some mills the employees nearly all live close enough to go home to

Y. M. C. A. AT THE RIVERSIDE AND DAN RIVER COTTON MILLS. COST, $75,000.

dinner, there are always enough who do not, to warrant having a lunch-room.

A number of mill lunch-rooms have been described in COTTON, and in some instances it was shown that the mills installed cooking equipment and served hot lunches to their employees at cost. This is a good thing, making for greater enjoyment of the food, better health and a better spirit among the help. But whether the manufacturer goes to this extent or not, he should have a place provided where meals may be eaten in comfort. In the average mill, where workers have no adequate place in the plant to eat, the dinner is not only not enjoyed as it should be, but cleanliness is discouraged. This makes for an untidy mill, and results in throwing paper, banana skins, etc., out of the windows, which makes for untidy grounds. Keeping the mill clean inside and out is an object well worth striving for, and this can be greatly advanced by the simple expedient of providing a lunch-room.

Since, as suggested, conservation of health through provisions of this kind has a definite relationship to the health service department, it is logical that the lunch-room be somewhere in the neighborhood of the building or section devoted to this general work. And when there is a special building erected, that is the right place to put it.

Recreation is another important feature of work for the employee. Fun has a fine effect on human beings, and fits them better for the day's work. This is something which can be developed by the employees themselves rather than the mill, but it can be encouraged by giving them a place to have their outings. A large central room in the employees' building might be given over to dances and social activities generally; and if there is vacant space

KANNAPOLIS, N. C., Y. M. C. A. COST $75,000.

THE Y. M. C. A. AT SPRAY, N. C. COST, $23,000.

about the mill, there is no reason why tennis courts for the use of employees should not be maintained. On holidays the employees should be given assistance in having picnics, at which the company would participate to the extent of offering prizes, etc. These whole-souled affairs help a lot in every way, and not the least is in bringing about a better understanding and acquaintance and mutual appreciation.

All of these features suggest, as the reader has doubtless guessed, the advantage of a special building for employees. It is a far cry from the little corner on the mill, devoted only to first-aid work, to the more elaborate independent structure given over to the activities concerned with the development of the employee; but there is no reason why this gap should not be bridged, provided always that the number of employees is great enough to make the investment worth while. In the small plant elaborate provisions may not be needed, but in the large one it is a great feature, and one to which more and more employers are coming as the logical solution of the problem of where and how to provide for the numerous kinds of work constantly developing along this line.

A substantial brick building, with rooms for health service and first aid, for physical examinations, for the employment department, for meetings of the employees and their committees, for lunching, for lockers, for recreation and all of the various kinds of work not directly related to the production of goods, can be built and equipped without prohibitive expense. Such a building is a monument to the interest of the mill-owner in his people, and an evidence that the mill is not trying simply to make money on the employees, but to help them to get enjoyment out of their connection with the institution. It creates loyalty and enthusiasm and stimulates interest and effort, besides making for convenience and greater efficiency in those departments which have a definite bearing on the character and quantity of production.

These are things for every manufacturer to think about.

A Mixup in Names.

In the May, 1917, number of COTTON a brief historical sketch was printed about Wadsworth, Howland & Company, Inc., the well-known paint manufacturers of Boston, Mass. The article was illustrated by views of the Granby Mills at Columbia, S. C., and at the end of the article it was stated that the paint used in these mills was "Dixielite," it being the understanding of the writer of the article that the various products manufactured by this company for the South were to be marketed under the general trade name of "Dixielite" products.

It seems that this understanding was an error and that "Bay State" liquid paints and varnishes and "Bay State" brick and cement coating will continue to retain its trade name as before, the mill white known as "Dixielite" being an entirely new product manufactured by this well-known company. Therefore, the writer in preparing the article in question should have stated that the Granby Mills at Columbia, S. C., were painted with "Bay State" brick and cement coating, nearly fifty barrels having been used.

Link-Belt roller chain for tractors and trucks is the title of a fourteen page illustrated booklet No. 326 issued by the Link-Belt Company, 39th St. and Stewart Avenue, Chicago, Ill. This booklet, with a companion booklet, No. 361, entitled "Some Facts About Roller Chain Drives" and containing the story of a chain drive by A. Lee Henson of the Smith Motor Truck Corporation of Chicago, form a very complete treatise on roller chains for driving purposes. This latter booklet is also illustrated, and copies of each may be obtained upon request.

Oxy-Acetylene Welding and Cutting.*

Blow-pipe welding is generally known as "autogenous" welding, although this term may also be applied to electric welding. Autogenous welding, however, has gradually come to be understood as meaning the oxy-acetylene blow-pipe welding process, which, in commercial fields, has practically supplanted the older methods of blow-pipe welding, such as the oxy-hydrogen and oxy-coal gas processes.

Autogenous welding must not be confused with soldering or brazing. As the name implies, a welded joint is one in which the parts joined together are "fused" into a solid piece of the same structure and character throughout. A soldered or a brazed joint is one in which a new metal, having certain adhesive qualities, is used as a binder. This new metal adheres to the parts to be joined but does not "fuse" with them, as its melting point is much lower than that of the part being operated upon.

The oxy-acetylene blow-pipe is commonly used wherever pieces of metal are to be *united,* or new metal added, as in the case of *building up* worn parts. All of the commercial metals can be welded successfully, including iron, steel, cast iron, malleable cast iron, aluminum, brass, copper, etc.

It does not take very long for an intelligent workman to become a fair welder on simple work. A few weeks' practice will develop all the skill necessary to enable such a workman to handle ordinary welding work likely to be met with in the average shop. Very thin plate work, however, requires more skill. It will take more time to attain the steadiness of hand necessary to make neat welds and to learn how best to overcome the buckling difficulties that invariably will be met. It is impossible to make any hard and fast rule on the best methods of accomplishing this. Experience is the best teacher, but to this must be added perseverance on the part of the operator.

The welding together of plates over ¼ inch thick should not be attempted on serious work until the operator has demonstrated, by first welding some sample pieces and then breaking them at the weld, that he is capable of making a sound, unburned joint of uniform strength and quality throughout.

A positive desire on the part of the workman to do good work is absolutely essential, because it is difficult to judge the quality of a weld by merely looking at it after completion. An operator should never be rushed. "Piece work" always should be avoided.

Anyone watching a blow-pipe welding operation for the first time is apt to come to the conclusion that the process is so simple that any workman can operate a torch with little or no practice. In a sense this is true, but it is essential that the operator have a fair knowledge of the nature and properties of the metals being welded, the effects of expansion and contraction, the reason for the use of fluxes and filling rods, the proper kind of filling material, how to apply heat without burning the metal, etc. All this is necessary to attain the most satisfactory results and this certainly cannot be gained in a single day.

Oxy-acetylene welding must be considered a trade—a skilled welding operator is just as much an artisan as a blacksmith or a machinist.

In operating a welding outfit leave the wrench on the acetylene valve spindle. See that after the acetylene valve is opened up there is no leakage at the gland nut; if there is, tighten the gland nut down.

Next observe if the unions between the regulators and the cylinder valves are tight. These, as well as the valve gland nuts, can be tested by means of soap and water. Never search for leaks with a match. It is highly important to pay close attention to this point.

If acetylene is allowed to escape at either the valve gland nut or at the union between the regulator and the valve, it may be ignited by the welding flame, even though the blow-pipe is 10 or 12 feet away. This is not a serious matter in itself, but the flame of the burning gas may melt the safety fuse plugs which are inserted into the heads of all acetylene cylinders for the purpose of allowing the gas to escape in case of the cylinders being in a fire. (This is an Interstate Commerce Commission requirement.) If this happens, the gas will escape very rapidly and there will be a very violent flame, which might cause fire damage. It will be noted that the oxygen pressure gauge and the acetylene gauge indicate the gas pressure in the cylinders as soon as the valves are opened.

The pressures are gradually increased alternately on the acetylene and oxygen by means of the regulating screws on the regulators until the correct welding flame is obtained, as explained under "The Correct Welding Flame." Final adjustments may be made by means of the valves on the blow-pipe.

The correct oxygen and acetylene working pressures for the various size blow-pipe tips are given in the welding table of the various manufacturers of welding outfits. After a few days' practice, the operator will learn to know when he has a correct welding flame and will pay less attention to the working pressure gauges on the regulators.

Note.—All adjustments at the regulators must be made while the blow-pipe is alight.

When it is desired to shut off the gases temporarily, first of all shut off the oxygen at the blow-pipe, then the acetylene at the blow-pipe.

When the welding outfit is not to be used for an hour or more, shut off the flame as you would for a temporary stop, then shut off both gases at the cylinder valves. Then open the blow-pipe valves to relieve the regulators and tubing of any pressure, after which the blow-pipe valves should be closed to prevent any possible leakage. Next release the oxygen and acetylene regulating screws by turning to the left. Never leave pressure in the regulators when not working. When pressure remains in the regulators, it is indicated on the pressure gauges.

It should be noted that the gas-tight joint between the tip and blow-pipe stem is not obtained on the threads but by a metal conical seat on the end of the stem and inside the tips. In case of a leak, do not use force and attempt to screw the tip further on, but remove it and clean the seat.

THE CORRECT WELDING FLAME.

Goggles—When working with the blow-pipe, always wear the special colored lens goggles provided. While the oxy-acetylene flame gives off only slight ultra-violet rays, the glare is so intense that it is very dazzling and tiresome to the naked eye. Goggles also guard the eyes against sparks and particles of molten metal.

Flame Adjustment—It is absolutely necessary at all times that the welding flame be neutral, that is, that there be no

*Courtesy of the Prest-O-Lite Company, Inc., and largely extracted from their instruction book. (Copyright, 1916.)

excess of oxygen or acetylene. A correctly adjusted (neutral) flame is shown at B, Fig. 1. It will be noted that the inner cone is clear, and well defined. A, Fig. 1, shows a flame having an excess of acetylene. The inner cone is ragged in appearance. To make such a flame "neutral," the acetylene should be cut down by reducing the pressure either at the regulator or at the blow-pipe, or by increasing the oxygen supply. C, Fig. 1, shows an excess of oxygen. The inner cone has a very pale violet color and is shorter than the cone in the neutral flame at B. Proper adjustment, in this case, is accomplished by reducing the oxygen pressure or increasing the acetylene pressure at the regulators or at the blow-pipe.

The beginner will be able to get a correct adjustment of the flame more easily, and with absolute certainty, by first opening the blow-pipe valves wide and then adjusting the oxygen and acetylene pressures at the regulators, as indicated by the Welding Table of the makers, starting the adjustment with a *slight excess of acetylene,* as indicated by the ragged appearance of the flame, and then slowly throttling the acetylene until a clear, well-defined inner cone is obtained.

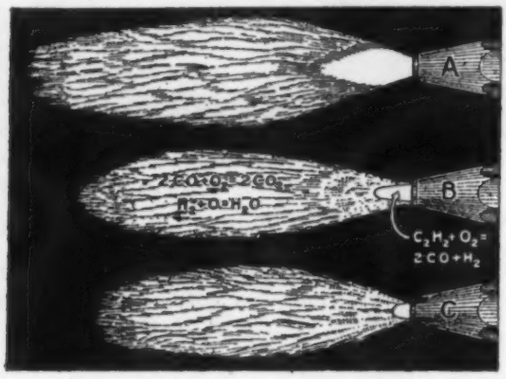


FIG. 1. ILLUSTRATING THE DIFFERENCE BETWEEN CORRECT AND INCORRECT FLAMES.

The regulation of the welding flame really means the regulation of the white inner cone. This cone should always be as large as possible, provided its outline is sharp and distinct. A long, clear inner cone should always be sought. The gases should be readjusted several times, if necessary, until the desired result is obtained.

When the blow-pipe is first lighted, it is cold. Radiated heat from the molten metal will gradually warm it. This is apt to affect the welding flame slightly. It usually will be found necessary to make readjustment of the gas pressures by means of the oxygen and acetylene needle valves on the blow-pipe after the blow-pipe has been at work for a few minutes.

Effects of Improper Regulation—It should be remembered that steels and cast iron are combinations of iron and carbon. It will be appreciated, therefore, that if the welding flame has an excess of oxygen, the metal will be decarbonized or oxidized, and the nature of the metal changed.

On the other hand, molten iron or steel will *absorb carbon.* Thus, excess of acetylene in a welding flame will carbonize the metal. This should be avoided, except in special cases where it is desired to carbonize mild steel.

Chemistry of Oxy-Acetylene Flame—Acetylene (C_2H_2) is composed of carbon (C) and hydrogen (H). On combustion, the carbon combines with oxygen to form carbon dioxide (CO_2) and the hydrogen combines with oxygen to form water vapor (H_2O). This takes place in the following manner:

When the gases issue from the blow-pipe into the welding flame, the acetylene immediately dissociates, in other words, it *splits up* into carbon and hydrogen which in combination with oxygen form respectively carbon dioxide and water vapor. In consequence of the high flame temperature (6,300 degrees Fahr.) the water vapor formed by this primary combustion, is immediately dissociated into hydrogen and oxygen. The oxygen assists in the burning of the carbon while the hydrogen (which can only combine with oxygen at a temperature below 4,000 degrees Fahr.) passes away from the high temperature zone and combines with the oxygen of the atmosphere at the outer blue part of the flame, where the temperature is sufficiently low to permit it. The result of this is that the inner or welding cone of the flame is protected by a shield of free hydrogen which prevents loss of heat and also tends to protect the weld from oxidation.

The temperature of the oxy-acetylene flame is approximately 6,300 degrees Fahr., at the hottest part of the flame, which is the tip of the inner white cone. The effect of this tremendous heat at the point of treatment is to bring the metal very rapidly to a molten state so that it flows together and mixes thoroughly with the proper quantity of metal added by the operator.

The molten mass thus formed does not merely cement two pieces of metal together—it *fuses* them into one uniform mass.

CARE OF THE WELDING BLOW-PIPE.

When working with the welding blow-pipe, endeavor to prevent its becoming heated to a point where it will not operate properly. The radiated heat from the part being worked on is all that need be considered. The heat from the flame issuing from the blow-pipe tip will not overheat the blow-pipe.

Should the blow-pipe tip be heated to such an extent that it fails to operate properly, that is, burn back of the tip instead of at the tip (commonly known as "back-firing"), first shut off the oxygen, then the acetylene, at the blow-pipe.

A pail of water should be kept handy in which to dip the hot blow-pipe, whenever the operator is welding in a hole or in a corner where radiated heat is likely to overheat the blow-pipe. When dipping the torch in water, do it carefully. Do not *plunge* it into water, but make several trials by dipping only the end of the tip, to draw the heat out as much as possible before plunging.

Before relighting the blow-pipe, turn on a small quantity of *oxygen only* to expel any steam that may have formed inside the blow-pipe.

Cleaning Out Tips—In case the welding tip becomes stopped with molten metal or flux, do not use a hard, sharp instrument to clean it out. The welding tips are carefully reamed to insure correct size and a perfectly round hole. If these conditions are disturbed by the use of an instrument harder than the tip itself, the blow-pipe will not operate properly. Use a soft copper wire if you must clean out the tip.

Cleaning Out Blow-Pipe—You will find a fine-mesh screen at each gas inlet of the blow-pipe which can be exposed by removing the union nuts. These screens col-

lect dust where it has had a chance to enter the hose. Should you find that the blow-pipe does not pass gas properly, these screens should be cleaned thoroughly.

Most blow-pipes are assembled by means of ground joint unions, no solder being used. This permits the blow-pipe to be easily taken apart but care must be used to see that none of the unions are injured by careless handling.

Always cool a blow-pipe before changing the tip; never put a cold tip on a hot stem.

Dividends for Foremen.

BY A. M. OLIVER.

The advisability of paying foremen dividends is now pretty well established, although the method of payment is still in an unsettled state.

There is little or no merit in a dividend that makes the giving of the dividend a present from the management. It should be arranged in such a manner that it will make a distinction between the good and the poor foremen. It should be arranged so that the foreman is obliged to keep his brain working in order to participate. A dividend, no matter what kind of a dividend, if it requires no energy, no thought or efficient supervision, is but a gift and a dividend that is a gift is detrimental.

Too often people in business seem to forget one vital fact—that nothing is self-propelling. Perpetual motion is not yet achieved. Behind every paying business is some person or persons who are displaying their ability, aiming at the one target—success.

To be successful as a foreman it is necessary to run the department to the best possible advantage and at the lowest possible cost. It is necessary to carry all the help needed to handle the output of the department, but it is not necessary to carry superfluous help in the anticipation that they may be needed sooner or later. You wouldn't buy an overcoat because you prejudged that it might come in handy some time. You only buy it if you need it and for that very reason a foreman, to be successful, should only buy the amount of labor that is needed to properly run his department. Labor is one of the most costly items that enters into a manufacturing business.

Some are of the opinion that the best way of paying a dividend to foremen is to wait until the end of the year when an inventory has been taken and figure the amount of dividend from the amount of the yearly earnings of the plant. I differ on this particular point and believe that it is not only unjust to the foremen, but the wait between dividends is so great that its usefulness is hindered. A foreman who received a dividend the first day of January and will not receive another dividend until one year from that day is very apt to regard his dividend as a matter of fact. He is very apt to say "Oh, well, I will get as much as the rest do next year. If I don't get a dividend the rest won't." He has so much to think about in the line of routine work that he often forgets he is working on a dividend basis.

The method of arriving at a dividend should be definite and should involve as few factors as possible. It should not hold a foreman responsible for the work over which he has no control. A foreman should not be obliged to lose $100 next January because the foreman of the next department was careless and carried 30 hands more than he needed or because another foreman hired all his friends who were out of work.

I believe a foreman should receive a dividend based on the cost of the department over which he has charge. He should receive his dividend daily, that is, his dividend should be reckoned by the day and he should receive the amount of his dividend in his pay envelope. He should be able to tell every night just what the cost of his department was for the day and just how much his dividend amounted to. He should not be obliged to wait until the yearly inventory has been taken and the stockholders' dividends declared.

In one department in a mill the cost per hundred pieces was about $2.01. We endeavored to prove to the foreman that he had too much help, with the result that we reduced the number of hands from 123 to 86. The cost started on the downward path. We found that some of the operatives had little or no job and that they were kept on in case they might be needed later. How long they were going to wait it was impossible to estimate. There were too many supply men, too many inspectors and too many handwashers. The sewing machine man was badly overpaid. A man was paid for lighting the lights in the middle of summer when no lights were needed. As a matter of fact the man was not lighting the lights but was receiving three hours' extra pay for nothing. Four men supplied seven inspecting machines when but two men were necessary. Men were allowed hours, wages and pieces without any apparent reason. We took time studies and changed methods.

These are but a few of the conditions we found existing in the department in which we were trying to install a foreman's dividend. After the superfluous help had left, and after the foreman had been shown how to utilize the spare time of operatives, and after the foreman had admitted that he still had plenty of help to run his department, we again figured the cost per hundred pieces. We installed a dividend in which the foreman participated daily, provided his cost per hundred pieces was within the limit allowed.

If the cost per hundred pieces ran from $1.85 to $1.95, the foreman received 5 per cent of his daily wages added to his wages. If the cost per hundred pieces ran between $1.80 and $1.85, the foreman received 7 per cent. If the cost per hundred pieces ran between $1.75 and $1.80, the foreman received 10 per cent. If the cost per hundred pieces was less than $1.75 the foreman received 20 per cent of his wages added to his regular or basic pay.

The foreman had some trouble for about one week trying to figure out just how much work he had to do and just how much help he could afford to carry to do it, in order that he would receive his dividend. He finally got it figured out to his satisfaction and had no trouble making his dividend of 20 per cent daily. We checked the cost about once a month over a considerable period and found that the cost per hundred pieces was approximately $1.70.

This foreman refused to accept college boys in the summer when he had no place for them. He couldn't do it and make his dividend. He refused to allow operatives to sit around half a day waiting for work. He transferred idle operatives to departments where their time could be profitably employed. He carried no extra help. He had all the help he needed and in the event of absence of an employee, he would borrow one from another foreman or manage for

a day without him. He saved the company more money in one week than he received in dividends in 52 weeks.

Sometimes it seems as though a business was going along automatically—sort of running itself. This condition is deceiving. Whenever you see a business running along these lines it is losing ground. Things will run for a time but they gradually move slower and slower and finally come to a standstill. There must be someone behind the business with a push, someone who has an interest in the cost, someone who has got to look out for the employer's interests in order that his own pocket will be properly served.

The foreman should be assured that his dividend rate will not be changed and that all suggestions that will save the company money will be investigated; that a suggestion that is accepted will not work a hardship on his dividend but will be to his advantage.

He will be satisfied because he has something to work for—something worth while. He realizes that his services are appreciated, that he is running his department to the best posible advantage and that making his daily dividend insures his position.

All dividends cannot be figured on the cost per piece or cost per hundred pieces. Sometimes, especially when only unproductive labor is involved, the method of paying a foreman's dividend is based on the ratio of overhead expense to the total daily cost of the department. It then becomes necessary that the foreman keep his overhead expense down in order that the percentage of overhead expense be within the limit allowed. This, I believe, is the better method of installing a dividend among foremen, principally because the foreman is obliged to carry the responsibility of his department only, the cost of which is the only unit over which he has control.

Cotton Comment.

BY H. AND B. BEER.

New Orleans, August 22nd, 1917.

The commercial crop for year ending with the close of July, 1917, was 12,941,000 bales vs. 12,938,000 for the season ending with July, 1916. During the past season the world consumed 14,046,000 bales of American cotton against 14,812,000 during the previous season. At the close of July the world's visible supply of American cotton was only 1,504,000 vs. 2,129,000 one year ago. In other words the trade consumed about 1,000,000 bales more of American cotton last season than was produced, which was made possible by spinners making further inroads on their reserve stocks.

At the close of July, mill stocks compared with last year, were as follows: Southern mills 725,000 vs. 721,000, Northern mills 501,000 vs. 706,000, European mill stocks 470,000, against 700,000.

By reason of the small visible supply and light mill stocks, there is the need of a larger crop this season than was made last year, as the crop last year was a little less than 13,000,000 bales, whereas the consumption was a little in excess of 14,000,000 bales. But even if the crop this year amounts to 14,000,000 bales, and the consumption 14,000,000 bales the trade would not be any better off at the close of the season next July than it was at the close of the past season.

The last Bureau report indicated a crop of 11,949,000 bales exclusive of linters. The next Bureau report is expected to furnish indications for a larger yield than was indicated one month ago, or about 12,500,000 bales, or a total including linters, of about 14,000,000 bales. These ideas are based upon returns from private sources denoting a marked improvement in the condition of the growing crop in nearly all sections of the belt except South, Central and Western Texas where the drouth remains unbroken, except in widely scattered localities.

Prospects in Oklahoma, Louisiana, Mississippi, Alabama and the South Atlantic states are decidedly better than at this time one year ago, while Arkansas and Tennessee are expected to do as well as last year.

But the greater portion of Texas has gone from bad to worse, the situation in some sections of the drouth area being deplorable, the only favorable sections of the state being the northern and eastern portions. Estimates for Texas range from 2,750,000 bales to 3,250,000 bales, whereas last year Texas made nearly 4,000,000 bales.

It is unfortunate for the trade, and for Texas itself, that the drouth has been so severe over the greater portion of that state this year, otherwise the trade would have been favored with a large crop. Now the best that can be expected is a moderate yield of only about 14,000,000 bales.

Of late the market has been on the down grade as result of improving crop conditions in nearly all districts of the belt except Texas, and because of lower prices being anticipated as receipts increase. The incentive to sell at present is the fact that prices are about $50 to $60 per bale higher than they were at this time one year ago, and the impression prevails that the interior will sell in the early part of the season as fast as the cotton is picked and ginned.

While it is possible, if not probable, for the market to experience a further sharp decline in the near future, the South is unlikely to sacrifice its cotton, and if the price falls to 20 cents, farmers will probably refuse to sell below that level except sparingly.

Under the circumstances it will probably be the better policy for the mills to buy in volume in event of another sharp break in values, as chances are that there will be the need of every bale made this year, and all of the bales are not made yet.

So far no tropical storm has made its appearance in the Gulf, but the period of such disturbances is at hand, and the cotton region may yet suffer from a storm.

Weevils appear to be increasing in the infested sections, and as the crop is late, they may do considerable damage next month.

Later in the fall, frost scares will have to be reckoned with.

If automatic looms were not employed in large numbers, there would be fully 25 per cent of the machinery in cotton mills standing idle today, not because the product could not be sold, but almost entirely because a sufficient supply of operatives could not be obtained. It would seem as if operatives would realize the developments and would make every effort to get out a large production, at least as large a production as in the past, when the wages were much lower.

Mill Conditions and Market Reviews.

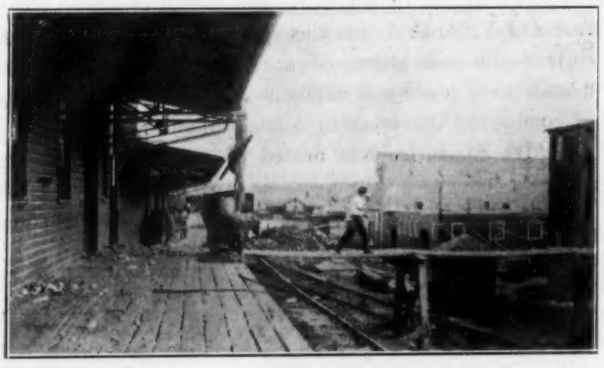
What the Southern Mills Are Doing.

One of the more interesting news items of the month was the passage by the Georgia Legislature of a bill incorporating the mill villages of the Callaway-Truitt group of mills at LaGrange, Ga., into a separate township to be known as Southwest LaGrange. Bonds are to be issued immediately and sold, the proceeds of which will be utilized in improving the streets and sidewalks of these villages, equipping them with proper water-works and sewerage facilities and arranging for suitable street lighting equipment. Over one thousand homes are to be connected to the water-works and sewers and equipped with suitable sanitary conveniences. Contracts will be let probably about the first of the year.

Last January COTTON described a large greenhouse that had been erected for the benefit of the operatives of this group of mills. The results obtained from the use of this greenhouse have been so satisfactory that at the present time the foundations are being laid for another of similar size and construction and for similar uses. The operatives have taken so much interest in the garden work as to seriously overcrowd the capacity of the present greenhouse.

A large two story brick building is being erected at the Hillside mill village that will house an up-to-date drug store just as soon as it is completed.

The Valley Waste Mills, which are a subsidiary of the Hillside Cotton Mills, are building two new buildings which may be seen on the extreme right of the illustration shown herewith. New machinery is being added to the present



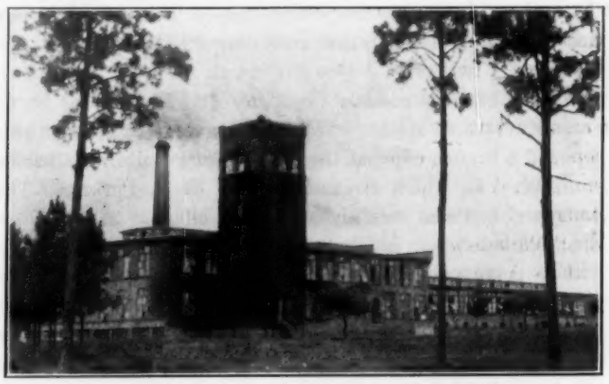
ONE OF THE THREE SPUR TRACKS SERVING THE WAREHOUSES OF THE VALLEY WASTE MILLS, A NEW BUILDING UNDER CONSTRUCTION AT THE RIGHT.

equipment of these mills to take care of the rapidly growing business. The panoramic view at the top of the next page shows one of their lines of warehouses and two of the three long service tracks which are run in alongside these warehouses to facilitate the unloading of waste and the loading of finished products for shipment.

A large addition has been added to the Martha Washington Inn, an up-to-date rooming house for women in the Hillside Mill village which was described several months ago in these columns.

Treasurer J. W. Parker, of the Pelham (Ga.) Mfg. Co., has been working marvelous changes at his mill during the past few months. New machinery has been added in all its preparatory process departments, and nearly half of the old plain looms have been thrown out and replaced by modern Northrup automatic looms. Just as soon as the deliveries can be made automatic looms will replace all the plain looms in this plant. At the present time the mill is operating largely on heavy duck under the efficient management of Superintendent W. J. McDonald.

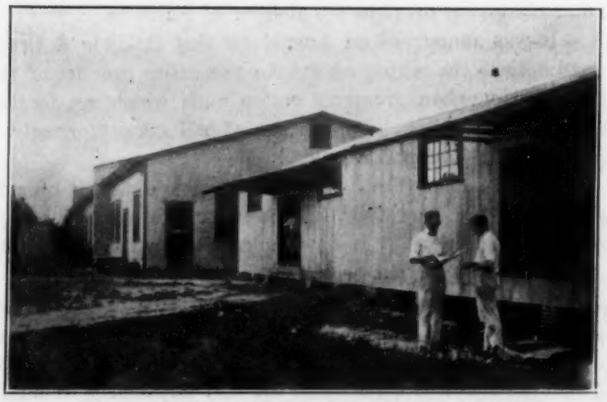
The Moultrie (Ga.) Cotton Mills are operating steadily on their regular lines of goods. They have recently added



PLANT OF THE MOULTRIE (GA.) COTTON MILLS.

one of the latest style of fly frames manufactured by the Saco-Lowell Shops, and are arranging to equip their slashers with a suitable system to take care of the condensation. The mill is in charge of Superintendent W. H. M. Woods.

Adjoining the plant of the Molutrie Cotton Mills is located the plant of the Riverside Manufacturing Company, where cotton mattresses of all grades are manufactured. The present capacity of this plant is about 200 mattresses a day, but new machinery is being purchased which will increase this production to approximately 260 mattresses per day. The accompanying illustration shows this plant, which is in charge of General Manager J. O. Macon, assisted by John M. Vereen. One unique feature of this plant is the use of individual straw board cartons in which their



THE RIVERSIDE MFG. CO., MOULTRIE, GA.

TWO OF THE RECEIVING PLATFORMS AT THE VALLEY WASTE MILLS, LAGRANGE, GA. A LINE OF WAREHOUSES DUPLICATING THOSE SHOWN ARE SERVED BY THE TRACK AND PLATFORM AT THE EXTREME LEFT.

higher grades of mattresses are rolled and packed, one to a container. These cartons are then suitably sealed at the mills, thus keeping the mattresses clean, wholesome and sanitary up to the time of its final sale to the user.

The addition to the W. A. Handley Manufacturing Co., Roanoke, Ala., is nearing completion. When finished new machinery will be installed, including 62 looms, 6,000 spindles and 4 twisters.

The Cement Products Company of Wilmington, N. C., manufacturers of the "Sanisep" sewage systems, have opened a branch office at the Union Trust Building, Charleston, W. Va., which is in charge of N. P. Perkins. This company has also recently opened an office at 328 Chestnut St., Philadelphia, in charge of Albert Priestman.

It is reported from Houston, Texas, that Frederick Wide, of London, England, and associates have purchased a site in Houston on which they will build a large plant for the manufacture of absorbent cotton. It is reported that the British Government has a proprietary interest in the project and that all of its output will be shipped to England. The initial unit of the output will cost about $100,000, and other units will be added as rapidly as they can be built.

The Halifax Cotton Mills of South Boston, Va., have increased their capital stock from $100,000 to $500,000, and it is understood that the increased capital will be utilized to develop the manufacture of automobile fabrics.

It is reported that J. J. Ward, the manager of the Lawrenceville (Ga.) Yarn Mills, anticipates enlarging this mill to the point where it will produce quadruple its present output. Officers of the company are at present in the East arranging for purchases of machinery.

Advices from Savannah, Ga., indicate that James Imbrie, of New York, is interested in the locating of a cotton manufacturing plant in the vicinity of Savannah.

It was announced on August 1st that Baldwin & Leslie had become the selling agents for the entire product of the Victor-Monoghan group of cotton mills which are located in South Carolina. This group of mills was formerly a part of the Parker Mills Co.

The Gonzales (Tex.) Cotton Mill, which has not been in operation for some time, has been reorganized and put in operation. The mill is now running on a day and night shift and turning out cotton duck.

Work has been begun by a large force of carpenters on the new mill village of the Abingdon Cotton Mills at Huntsville, Ala. More than 60 houses are to be built of four to six rooms capacity in the first installment of buildings. All building material is on the ground and ready for erection, and the houses are expected to be completed at the rate of one house a day until the contract is finished. As soon as this first lot of sixty is completed it will be followed by the remainder.

The Trenton Cotton Mills, Gastonia, N. C., will increase the capitalization to $350,000, and it is said that the company has plans for extensive additions.

The Palmetto (Ga.) Cotton Mills, which formerly operated their machines by steam power, will install equipment for the electric drive.

The White Cotton Co., Graham, N. C., has been granted a charter to do a general cotton manufacturing business, including yarns, threads, woven cloth and kindred goods The capital stock is $25,000. The incorporators are W. E. White, S. S. Holt and E. S. Parker.

At the suggestion of the South Carolina Cotton Manufacturers' Association, the cotton mill superintendents of South Carolina held a meeting at Asheville, N. C., recently, perfecting an organization and discussing various matters of interest to the members of the organization. F. G. Cobb of Greenville, S. C., was elected president, S. T. Buchanan of Piedmont, S. C., was named as vice president, Jas. A. Chapman, Jr., of Inman, S. C., was elected secretary. Welfare and Y. M. C. A. work as related to the workers of the cotton mills was discussed at the meeting. Several addresses were made and valuable suggestions as to methods of conducting this work in mill communities outlined. An executive committee was named by the new organization and this committee will have charge of the selection of time and place for the next meeting. About 100 superintendents attended the meeting.

The cotton mill which is being built by John P. Yount, near Newton, N. C., is 80 x 200 feet, two stories high. The machinery for this mill will be shipped from his present mill at Walterboro, S. C. Thirty tenament houses for the employees are also being built.

The Draper Corporation of Hopedale, Mass., are sending to their customers and friends a handsomely framed wall picture of the works of the Draper Corporation and its surrounding residential sections as it appeared in 1916. The frame is of dark oak which harmonizes nicely with the color scheme of the picture. The picture illustrates graphically not only the immense size to which this corporation has grown, but also the care with which they look after their operatives by providing them with handsome and artistiely arranged residences in close proximity to their source of employment.

New England Mill Situation.

Many New England cotton manufacturers are uneasy about the long future of business. They apprehend that prices have reached such a high level that consumption of many cloths made in this section will be restricted. They are fearful that labor conditions will grow worse as the war goes on, not only limiting production but cutting profits and making deliveries uncertain. They have prospered greatly in the past two years and are now inclined to view the situation as one where the top has been reached and where it is now time to look forward to the decline, or the change that must come after the war.

Manufacturers are more timid than merchants appear to be. While it is conceded that prices are very high, merchants believe that old levels of values based upon the low levels of 1898, must be forgotten in this country for a long time to come. They do not look for low farm products, low steel products, low labor costs, or low shipping rates for years to come. They think that consumers are going to get accustomed to high prices before the war is over, and unless invasion of this country becomes possible, they predict a prompt after-war recovery on the part of all textile business, and a quick readjustment to cloths that will be wanted badly abroad and at home.

It developed in the past few days that the government, and others engaged in war work, have purchased since this year began, for immediate and future delivery, between $200,000,000 and $250,000,000 worth of cottons of various kinds. One single kind of cotton duck to the value of $14,000,000 has been purchased. Added to this is the certainty now that the fiscal year's exports of cotton goods will reach a value of $135,000,000, and there are the two strongest factors ever known in the cotton goods trade that will make for sustained business for many months, war or no war.

New England mills have secured a large share of this business and there are some of them running on cloth orders that cannot be completed before next June at the earliest. Abounding prosperity is shown in the mill earnings for the third quarter of the year, Fall River mills having paid an average dividend of 3.64 per cent on a capitalization of about $31,000,000.

There has been a very general hesitation in business for a month or two yet prices on many cloths have risen and buyers have paid the prices asked by the mills. Fruit of the loom 4-4 muslins were supposed a month or more ago to have reached the top at 16 cents a yard. They were sold at 18 cents during the month, and the manufacturers of this standard brand announce that they can take no additional business for delivery before November. Wide sheetings were supposed to be priced at the top when they reached a basis of 48 cents for 10-4 goods. During the month, Pequot and other well-known brands were advanced to a basis of 55 cents for the 10-4 goods. It was thought that when 2.20 denims were priced at 27 cents that a price had been reached beyond which mills could not go. But manufacturers of overalls have bought more goods at 28 cents, and they would buy at this price into the first quarter of next year if agents or mills would sell for late delivery.

One of the most surprising events of the month has been the very large business booked on dress ginghams. It was noted in this correspondence a month ago that an advance of 66 per cent had been made in prices compared with a year ago. Cloths that were priced at 9 cents a yard in 1916 were priced by the mill at 15 cents and other goods that were then 10 cents were priced at 16½ c. If buyers of cloths of this character had refused to operate for long term spring delivery, it might have been fairly stated that high prices were curtailing consumption, or that the trade had gone beyond a reasonable limit in price making.

What actually happened was this. Such concerns as the Amoskeag Company actually sold a larger volume of dress ginghams at the higher prices than they were able to sell last year at the lower figures. They have sold all they can make for the spring season. On some lines they have sold more than they can make and will have to allot orders. Other concerns making dress ginghams had a similar experience. Two or three of the finest qualities of dress ginghams made in this country are so far sold ahead that there is little hope of agents being in a position to accept new business this side of next summer. This condition is due in part to the vogue for dress ginghams, and it is due in some part to the desire for a cloth that will give economical service. In any event, price did not stop the placing of the business by the largest and most far seeing jobbers and cutters of dry goods.

Another curious development of war time selling of cottons has been the larger purchases made of poplins, gabardines, suiting cloths and a number of printed foulards, that are always more or less staple, but have been ordered this year in a larger way than is customary. Wherever cloths have a superior wearing power they have been ordered for future delivery. Piece dyed goods have sold better proportionally than in any ordinary season. There has not been as much business as usual offering on voiles, and sheer fancies, nor on some of the cotton and silks. On the other hand there has been a good business done on fine shirtings, on madras for shirts and waists, and on the heavy skirting fabrics in fancy weaves. These things indicate to some extent that even if there is no speculative boom in sight, there is at least a good promise of a full and steady business on cloths that will give good service.

The converters have not been reordering fine goods in a normal way and for this reason centers like New Bedford are not active in fine cloths. But the mills have large yarn orders in hand and have made very few price concessions to secure business.

Print cloth markets have been soft and irregular in central markets where resales from second hands have been numerous. The mills have been so comfortably supplied with orders and so generally bare of stocks that they have not been moved to lower prices to secure business. The narrow print cloths and some of the odd width goods have held their value and so have some of the goods not of staple construction. Some narrow print cloths sold as late as August 20 at 56½ cents a pound.

Standard prints are now quoted at 12½ cents a yard, and staple ginghams have reached the level of 15 cents a yard. There has been a prolonged strike of cloth printers at the American Printing Company but as the works are busy on some large government orders for piece dyed khaki goods, the absence of the printers has not stopped production. Other printers are active, and are shipping many goods abroad.

Trade in quilts has been lighter than usual and offers have been made to sell spring goods at low prices by some few mills that have been carrying stocks. Two of the large quilt mills have recently accepted orders from the government to make a million yards each of cotton duck, using 13⅓-ply yarns, and weaving the material on 60 or on 90 inch looms, strengthened to enable them to do the work. The fancy towel business has been light while the huck towel trade has been good.

The mills engaged on government work other than duck of various sorts have been turning out marquisettes for mosquito bars, a cloth for gas masks, many sorts of goods for medical supplies, and millions of yards of twills and drills for uniform and other purposes. Some of the gingham mills are making special cloths for use by pajama manufacturers, while others are making a special cloth for shirtings, heavier than the usual cotton fabric and thick enough to withstand the wind. Several mills are engaged on samples of cloths to be used for aeroplane wings.

Bleacheries and finishing works are not as busy as they were on goods for the general commercial trade. The call for goods for the government is unlimited and some plants are doing nothing else save government dyeing or finishing. Their normal business is being taken care of in other directions. The trade offered for job printers is less than last year and there is also less business offering on fine bleaching.

The labor conditions are very much unsettled in some respects. Manufacturers expect a demand for further wage advances. There have been very few symptoms of I. W. W. unrest in the district, and on the whole there is less cause for anxiety than other sections of the country are reporting. That it will be impossible to maintain production up to the capacity of the machinery is almost certain, and on the other hand some manufacturers say that the winter will find many operatives ready to keep every machine running that is engaged on government work.

New Bedford manufacturers have been agitating a proposition to decline to pay cotton bills on sight of draft and bill of lading, substituting therefor, a proposition to pay 10 days after the receipt of the cotton. This unusual suggestion is the outcome of troubles growing out of deliveries of inferior cotton during the past cotton year and the long delays in settling claims. The manufacturers contend that they must sell their cloth subject to being up to sample, and from 10 to 60 days is allowed the buyer in which he can pay. Time is given to him to inspect his merchandise.

This is such a radical departure from the trade custom among cotton brokers and cotton factors, that it would receive consideration of no consequence in a normal time. But this is war time and many old customs are being overturned. Manufacturers in other sections of New England are more worried about how they will get cotton transported than they are about settling their bills in the old way, or adjusting claims as they occur.

When a woman winds a towel around her head and calls for a bucket of water it means the beginning of a big day, but when a man winds a towel around his head and calls for water it means the end of a big night.

Lancashire Notes.

BY AN ENGLISH CORRESPONDENT.

The Lancashire cotton trade is now being carried on under conditions of an absolutely unprecedented nature. A Cotton Control Board has been set up and, armed with the widest powers and backed by the Defense of the Realm Act, has undisputed authority over everything and everybody connected with the trade. The Control Board is the outcome of the recent crisis when prices leaped up to nearly 1s. 8d. per pound and by order of the Board of Trade, the American and Egyptian futures markets were closed at Liverpool on June 20th. Following the closing of the markets, immediately there were conferences at the Board of Trade attended by representatives of various cotton trade interests. At the final conference the president of the Board of Trade (Sir Albert Stanley) stated that unless wild speculation were prevented the trade could not be carried on and that to stop speculation and cope with the situation generally he proposed to set up a Board of Control. The representatives present agreed to this and the board was appointed forthwith.

The board lost no time in getting to work and the following day—June 22d—a notice was posted at the Liverpool Exchange stating that in accordance with an Order in Council just issued, no member could sell spot cotton unless the buyer held a license. The Order referred to was as follows and gives a good idea of the commercial revolution which had been brought about.

This was the beginning. The regulations in force at the time of writing are as follows:

"1. A person shall not, without license (general or special) granted by or under the authority of the Board of Trade nor otherwise than in accordance with the conditions, if any, subject to which such a license is granted, purchase any raw cotton, and a person shall not sell or offer to sell raw cotton to any person except the holder of such a license, nor to the holder of such a license otherwise than in accordance with such conditions as aforesaid. The conditions imposed by the Board of Trade may include conditions as to maximum price, provided that any price so fixed shall not apply to the sale of any particular parcel of raw cotton by a person who had previously entered into a contract for the purchase thereof so as to reduce the selling price of that parcel below the cost incurred by that person in purchasing the cotton and bringing it to the United Kingdom, together with such margin to cover incidental expenses and profit as the Board of Trade may think reasonable.

"2. All importers and dealers in raw cotton and cotton spinners shall comply with any general or special directions which may be given by or under the authority of the Board of Trade as to the sale, disposal, delivery, or use of raw cotton.

"3. Infringements of this order are summary offenses subject to penalties under the Defense of the Realm regulation."

Importations.

"The Cotton Control Board hereby issues a general license to the members of the Liverpool Cotton Association, Ltd., and to the cotton importers of the Manchester Cotton Association to purchase cotton abroad—that is to say, it authorizes such persons to purchase cotton abroad without application to the board for a license. The board are further prepared to consider applications for special licenses to purchase cotton abroad from spinners or other persons who have been in the habit of importing cotton direct from abroad.

"Spinners may purchase cotton abroad c.i.f., f.o.b., and for deferred delivery, Liverpool terms, through importers without license. A weekly return of such sales must be made by importers, stating the number of bales so sold, but quality and price need not be stated. Such return must be made, in the case of members of the Liverpool Cotton Association, to the Secretary of the Association, and in the case of the

members of the Manchester Association to the Secretary of that Association, and by all firms outside the two Associations named to the Secretary of the Cotton Control Board. Such return must be made up to Thursday night and sent in on Friday.

"No contract made on c.i.f. or f.o.b. terms may be filled out of stock in Liverpool or elsewhere in the United Kingdom.

"No contract sold on deferred delivery, Liverpool terms, may be filled by cotton taken out of existing stocks, unless the cotton so taken out is promptly replaced by the importation of cotton of a similar growth.

Cotton for Immediate Requirements.

"Cotton spinners requiring a license for the purchase of spot cotton to meet immediate requirements are instructed to apply in person to the Secretary at the offices of the Cotton Control Board, Victoria Hotel, Manchester, between 10 a. m. and 12 m. and 2:30 and 3:30 p. m. each day (Saturdays excepted). They must be in a position to state what are their weekly requirements and the number of weeks' supply at present held by them. For the present licenses will be granted for the purchase of not more than one week's supply at a time. Spinners who find it impossible to attend in person because they reside at a distance, or for any other special reason, may apply in writing, but in doing so they must state full particulars as above.

"The Control Board wishes it to be clearly understood that the licenses are issued to spinners for their immediate requirements, and that any purchases of cotton that are made must be for prompt delivery only.

"Spinners who have cotton "on call" may fix same and take delivery without the authorization of the board until further notice.

Trading In Futures.

"Futures may be bought and sold under the regulations of the Liverpool Cotton Association, dated June 28, without reference to the Cotton Control Board. The regulations referred to are as follows:

1. Trading in futures to be confined to—

"(a) Buying by spinners in the United Kingdom to cover sales of yarn, and buying by importers against sales of actual cotton to spinners in the United Kingdom.

"(b) Selling of hedges by importers and spinners against purchases of actual cotton for shipment to, or in, the United Kingdom.

"(c) Liquidation of open contracts. As regards contracts, no transfer of these to any other position can be made except in the case of hedges by importers against actual cotton shipped to the United Kingdom, and in the case of purchases by spinners in the United Kingdom against sales of yarn.

"From the above it will be seen that no straddles or speculative business can be transacted by or for members, or on account of clients.

"2. Prices of futures to be advanced or reduced from time to time by a committee who will use as their basis the prices prevailing in the Southern States of America for American futures and in Alexandria for Egyptian futures. The Committee, however, to have discretion to fix a lower price than would be indicated by this basis. The differences between all months to remain as fixed on Wednesday, June 20.

"No tenders will be allowed until further notice.

"The changing by spinners of futures into spot cotton may only be done under license from the Central Board, and should a license be granted a spinner will not be allowed to change more than his weekly consumption in any one week. If a spinner's consumption is less than 100 bales in American or 50 bales in Egyptian he is entitled to change up to 100 bales in American or, in the case of Egyptian, up to 50 bales.

"Open contracts in futures bought or sold prior to June 29 by spinners or manufacturers can be liquidated without the authorization of the Cotton Control Board, but such contracts cannot be converted into actual cotton without a license from the board.

Spinners May Buy From Spinners.

"The Cotton Control Board issues a general license to spinners to buy cotton from each other. That is to say, it authorizes such persons to trade in cotton with each other without application for a license. The board is of the opinion that the exercising of this right may considerably ease the position in the present crisis."

The board sits in Manchester and is thoroughly representative of the whole trade.

Apart from the issue of licenses the first business of the board was to consider the necessity for curtailing production and, if it were agreed that it should be curtailed, what should be the nature of the steps taken to effect that end. A decision on this depended, of course on the amount of cotton available, so the board decided to take a census of stocks. Spinners were asked to state the number of bales at their mills; number of bales stored at railway, local or Manchester warehouse (but not at Liverpool) or which were advised in transit in this country; number of bales of cotton actually bought for forward delivery up to October 21st, whether on call or fixed; number of ring and mule spindles; average number of spindles not working during past four weeks; average number of bales used during past four weeks; number of bales normally used per week before the war when working full time; average counts spun (twist and weft). The manufacturers were asked to supply the number of looms and the number not working. Failure to supply the information asked for was an offense under the Defense of the Realm Act. The census was completed in about ten days but, contrary to general expectations, the board did not enforce any reduction in output when they had the facts before them. The official announcement said the board had "decided not to reccommend any immediate curtailment of production. Should it become necessary to reduce the consumption of cotton at some future time, adequate notice will be given to afford ample opportunity for making any necessary adjustments." In the meantime licenses would be granted for the purchase of not more than one week's supply of spot cotton at a time to spinners who had less than two weeks in stock.

The tonnage question is, of course, a very important factor. Possibly the holding out by the Board of Trade of a promise of greater shipping facilities is responsible for the decision not to curtail production just at present.. Many men, however, are strongly advocating either a reduction of hours or the stoppage of a certain percentage of spindles. I, myself, have been told by a leading authority that there is enough cotton in the world to keep running at full time all the spindles that are now working and that the solution of the difficulties lies in the provision of more shipping.

Those who are anxious for the developing of cotton growing with the British empire have seized the opportunity afforded by the present situation to press their case. It has, for example, been pointed out that in Uganda there are 25,000 bales of cotton (which at present prices are worth £1,000,000) waiting to be shipped—but there are no ships. The Government has, however, at length announced the composition of the committee which is "to investigate the best means of developing the growing of cotton within the Empire and to advise the Government as to the necessary measures to be taken for this purpose." The chairman of the committee is Sir Henry Birchenough K. C. M. G., and on it are representatives of the Foreign Office, Colonial Office, the India Office, the Government of India, the cotton employers' associations, the operatives' trade unions, the British Cotton Growing Association, the merchants, the spinners, the Liverpool Cotton Association, the Indian trade and Dr. W. Lawrence Balls as the scientific expert.

The Card and Blowing Room Operatives' Amalgamation has just put in a claim for a further advance of wages. This time 25 per cent is asked for. Already the wages of this class of workers have been advanced 20 per cent during the period of the war, but as the cost of living steadily rises a still further increase is being asked for.

The Yarn Market.

While the yarn market has been comparatively slow during the last month, as is usual in August, the outstanding feature has been the Government orders. Increased activity and lower prices are predicted for early fall, largely because of the top-heavy tendency of the raw cotton market, a decided slump in this market being predicted by many. Undoubtedly, a decline of the raw staple would bring an easing of yarn prices, and with the harvesting of the new crop, the lack of export facilities and the undoubted fact that the crop this year is to be much larger than the bulls have believed, will all tend to induce a decline between now and December 1st. When this decline does come it will probably come with a rush, despite the amendment to the rules of the New York Cotton Exchange recently adopted, which fixed the range of fluctuation in prices at three cents per pound below or above the previous day's quotations in trading in futures. This new rule, which became effective after August 27th prescribes that the closing net price on any given day shall not be less than the minimum price as fixed by the rule. This rule is to remain in effect during the period of the war and for such period thereafter as the board of managers shall determine. The rule provides:

"To avoid abnormal fluctuations of prices, caused by conditions created by the European war and injurious speculation incident thereto, trades for any month for future delivery shall, during any one day, not be made at an advance of more than 3 cents a pound above the lowest previous price for such month on that date, nor at a decline of more than 3 cents a pound below the highest previous price for such month on that day."

The opening week of the month provided a very slack market owing to the extreme heat, which in many instances caused factories to close down at least a part of the time. Carded yarns on cones were somewhat slow and weavers were looking for business.

As the month closes it finds the prices irregular on combed yarns with an inclination toward a downward tendency. Predictions are being freely made in Philadelphia that combed yarns are going to decline, although some Eastern spinners are very confident that cotton suitable for the finer grades of combed yarns will be so high in price this fall and that prices of such yarns will advance. In consequence of this, they do not care to sell for deliveries very far ahead.

It is reported that some knitters of both hosiery and underwear are feeling out the market on carded yarns on cones, inquiries for 50,000 pounds and more being received. In one or two instances lots of 200,000 pounds have come to light. However, indications point to the fact that these inquiries are generally intended to get a line on dealers' and spinners' ideas of values. Spot yarns are being bought largely from hand to mouth while the buyers wait for developments in the raw staple spot market.

Carded weaving yarns continue in poor demand, with the spinners generally quoting higher than the market. Undoubtedly the Government demand has been the cause of the comparatively steady high prices in these lines. It is believed by many, however, that yarns of this character are going to sell lower in the near future.

Following are recent quotations on the Philadelphia market:

Southern Single Skeins.

4s to 8s	39 @39½	10s	39½ @40
12s	40½ @41	14s	40½ @41
24s	46½ @47	26s	47 @47½
24s	46½ @41	26s	47 @47½
30s	54 @55		

Southern Single Warps.

8s	39½ @40	10s	40 @40½
12s	40½ @41	14s	40½ @41
16s	41 @41½	20s	41½ @42
26s	47½ @48	30s	56 @57
40s	60 @61		

Carpet and Upholstery Yarns in Skeins.

8-4 slack	39 @39½	9-4 slack	39½ @40
8-3-4 hard twist	35 @36		

Southern Two-Ply Skeins.

8s	40 @40½	10s	40½ @41
12s	41 @41½	14s	38 @39
16s	40 @41	20s	39 @39½
24s	47½ @48	26s	48½ @49
30s	48 @49	40s	60 @61
50s	80 @81	60s	90 @91

Southern Two-Ply Warps.

8s	40 @40½	10s	40½ @41
12s	41½ @42	14s	41½ @42
16s	42 @42½	20s	39½ @40
24s	48 @48½	26s	48½ @49
30s	49½ @50	40s	61 @62
50s	80 @81		

Northern Two-Ply Carded Peeler Skeins.

20s	43½ @44	24s	48 @49
26s	49 @50	36s	59 @60
40s	67 @68	50s	83 @84

Two-Ply Combed Peeler Skeins.

20s	60 @61	24s	62 @64
30s	70 @73	40s	80 @81
50s	90 @93	60s	$1.00@1.05
70s	$1.08@1.12	80s	$1.30@1.35

Southern Frame Spun Yarn on Cones.

8s	39½ @40	10s	40 @41
14s	40½ @41½	14s	42 @42½
16s	43 @43½	18s	44 @44½
20s	45 @46	22s	46½ @47
24s	48 @48½	26s	50 @50½
30s	53 @53½	40s	64 @65
30s tying-in	50 @51		

Northern Mule Spun Carded Yarn on Cones.

10s	44 @44½	12s	45 @45½
14s	46 @46½	16s	46½ @47½
18s	48 @48½	20s	49½ @50
24s	51 @51½	26s	52 @52½
30s	57 @57½	40s	67 @68

Northern Mule Spun Combed Peeler Yarn on Cones.

10s	59 @60	12s	60 @61
14s	61 @62	16s	63 @64
18s	64 @65	20s	66 @67
26s	67 @68	30s	72 @78
36s	75 @75	40s	84 @85

Courtesy.

Treating a customer like a rich uncle, so you may extract his coin, is not courtesy—that's foresight.

Offering a seat to the man who enters your office is not courtesy—that's duty.

Listening to the grumblings, growlings and groanings of a bore without remonstrance is not courtesy—that's forebearance.

Offering a companion a cigar when you light one yourself is not courtesy—you'd be ill-bred if you didn't.

Helping a pretty girl across the street, holding her umbrella, carrying her poodle—none of these is courtesy. The first two are a pleasure, and the last is politeness.

Courtesy is doing that which nothing under the sun makes you do but human kindness. Courtesy springs from the heart; if the mind prompts the action there is a reason; if there be a reason, it is not courtesy; for courtesy has no reason. Courtesy is good-will and good-will is prompted by the heart full of love to be kind.

Only the generous man is truly courteous—he gives freely without a thought of receiving anything in return. The generous man has developed kindness to such an extent that he considers everyone as good as himself—and treats others not as he should like to be treated (for generosity asks nothing) but as he ought to be treated.—*Drew's Imprint.*

COTTON MANUFACTURING.

Designs for Fancy Cotton Fabrics.

BY T. WOODHOUSE AND J. IRELAND.

PART THIRTY-SEVEN.

The cloth illustrated in Fig. 165 is very attractive, and the construction is quite simple. It is another example of a striped pattern produced by weave effect alone—both warp and filling being white and of approximately the same size. With the exception of the v-shaped or herring-bone portions, the whole of the cloth is perfectly plain. Two repeats of the design in the way of the weft are shown at K. Fig. 166, from which the construction of the herring-bone stripe is clear. The unit design embraces 62 threads and 12 picks, i. e., 21 threads for the v-shaped stripe, and 41 threads for the plain stripe. If all the plain threads are drawn on to two harnesses, as shown by the draft at L, 13 harnesses in all will be required, while the weaving plan M on 13 harnesses will be complete on 12 picks. There are 92 threads per inch and 78 picks per inch in the finished cloth.

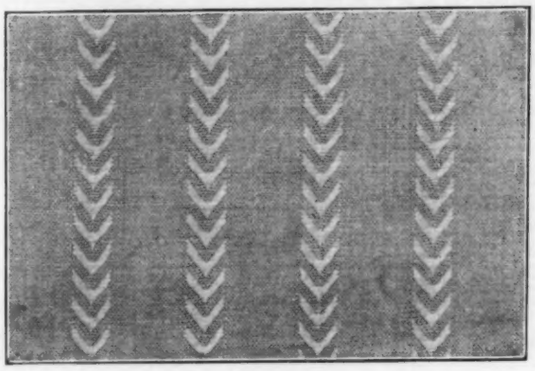


FIG. 165.

A very pretty pattern developed in white yarns is that reproduced in Fig. 167. The finished fabric contains 100 threads per inch, and 72 picks per inch. The most prominent feature of the design is the large spot pattern. These spots appear in straight horizontal lines upon a perfectly plain ground. The most attractive part of the fabric, however, consists of the simple, yet elegant, narrow stripes which appear alternately with the vertical rows of spots.

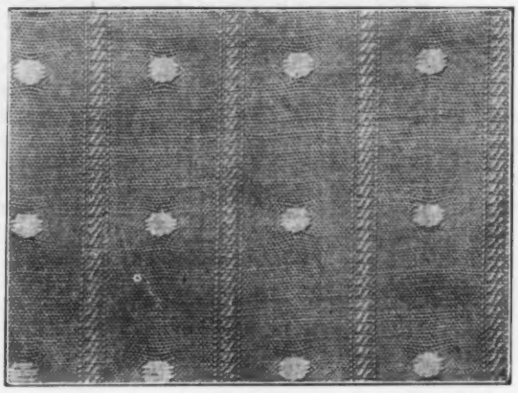


FIG. 167.

These stripes consist of a central portion of six threads weaving in the one up and three down order, while on each edge are three threads weaving plain, the outer thread on each side being much thicker than the rest. It is this difference in thickness which defines so sharply the edges of these narrow stripes, and which is responsible for the attractiveness of this particular section of the fabric.

One unit of the design, on 64 threads and 40 picks, appears at N, Fig. 168. The first and twelfth threads of the narrow stripe are marked in solid, and these clearly represent the above mentioned thick warp threads. The remaining 52 threads are required for the broad stripe with the large spot centrally situated and developed by the floats of filling. It is well known that circular spots on a small num-

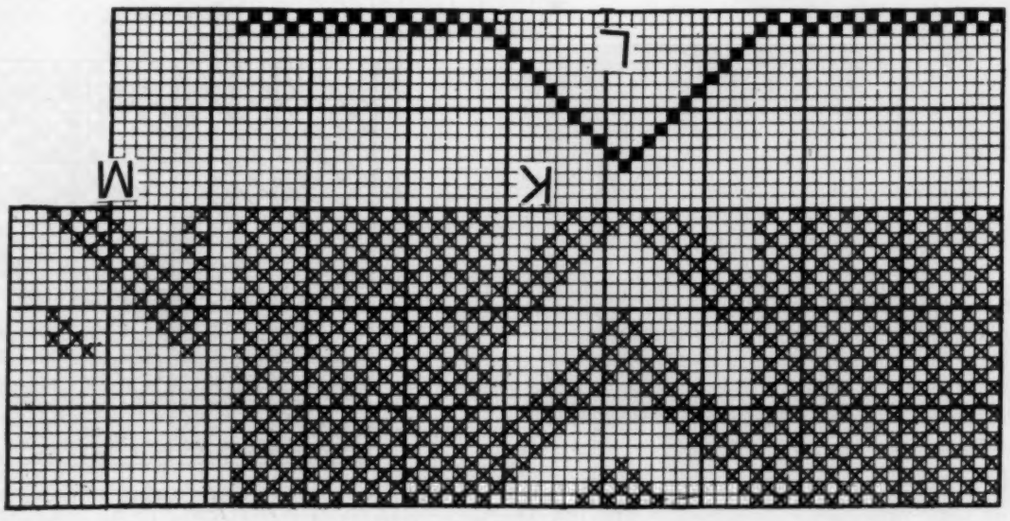


FIG. 166.

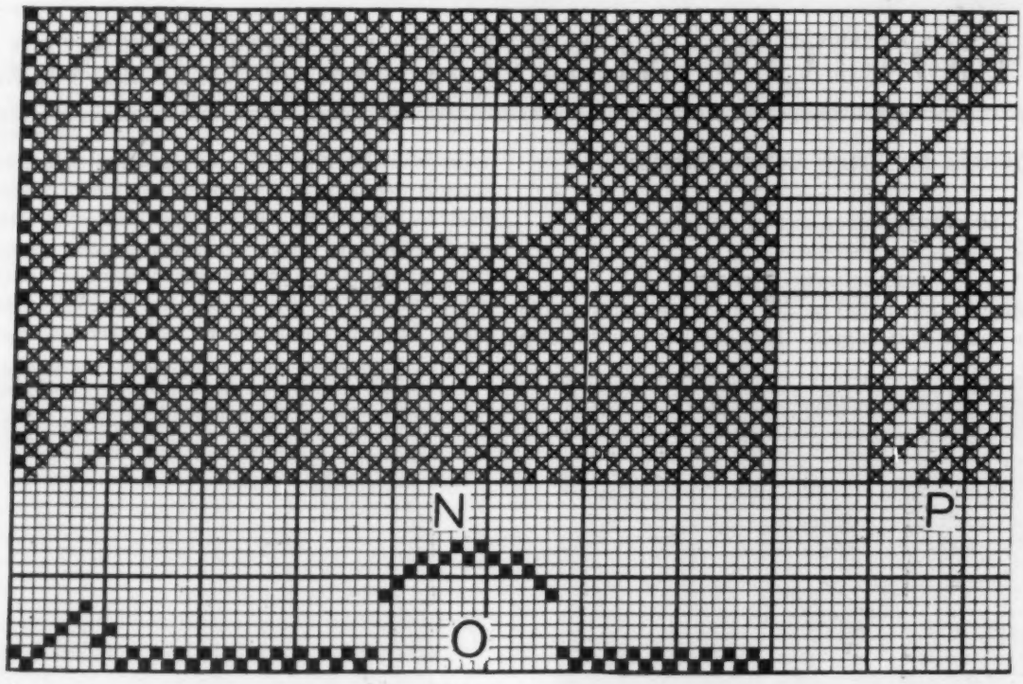


FIG. 168.

ber of threads and picks are difficult to make. A slightly different tension on the cloth in weaving is sufficient to spoil the desired circular effect, while with some other forms of ornament this defect may pass unnoticed. With all the plain threads drawn on two harnesses, as illustrated in the draft at O, Fig. 168, the weaving plan, P, would consist of 11 harnesses and 52 picks, 40 of which are shown. It will be seen that the large spot effect has been designed to occupy only 5 harnesses, while naturally, 4 harnesses are required for the one up and three down twill and 2 for the plain weave.

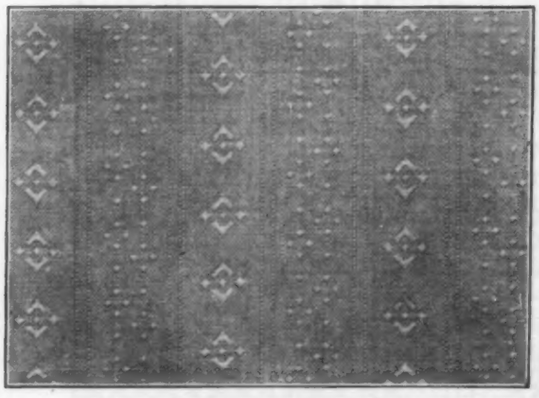


FIG. 169.

A much more elaborate pattern of a stripe form and developed in white yarns is that illustrated in Fig. 169. The finished cloth contains 92 threads per inch, and 80 picks per inch. The ground weave of all the stripes is plain weave, and the elaboration is obtained partly by a diversity in the weaves and partly by the introduction of a few heavy warp threads. It is remarkable how well these heavy threads isolate the various sections, and at the same time assert their individuality. There are really five distinct stripes in the cloth illustrated in Fig. 169. 1. The one in which a kind of broken diamond of a comparatively large size is developed upon a plain ground. 2. The one in which a cluster of small diamonds are ingeniously arranged amongst themselves in diamond form. 3. The one in which a few plain threads of the normal size are bounded on each side by a single thick thread. 4. The one which the same diamonds as in 1 appear but arranged midway. 5. The cluster of diamonds in 2 turned over and dropped.

One unit of the complete design occupies 184 threads and 30 picks, and is represented by the design at Fig. 170. In this unit there are two stripes of the large broken diamond marked T which, as mentioned, are on the drop prin-

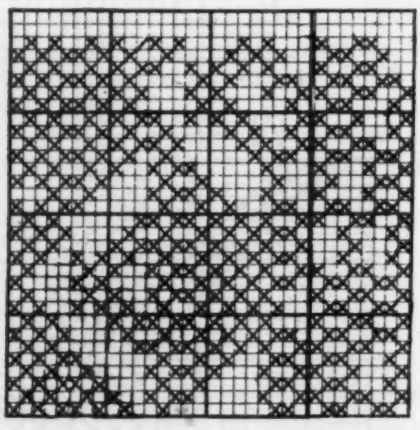
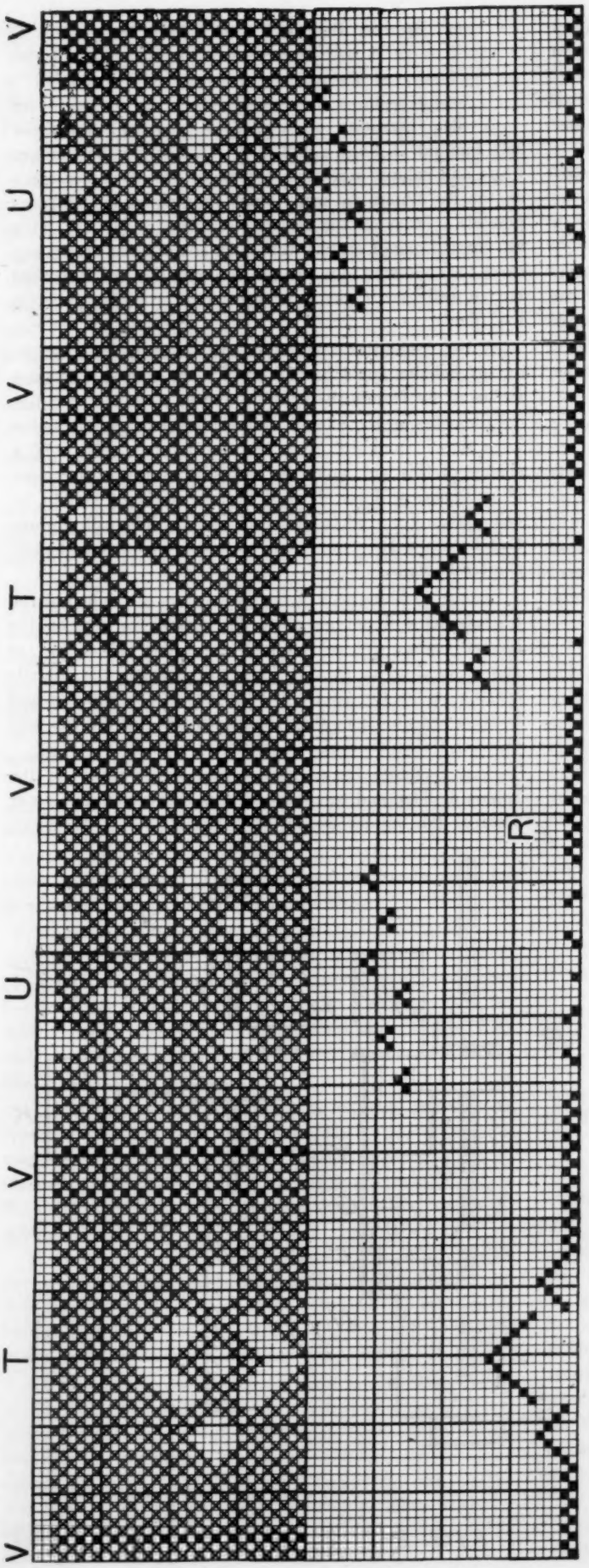


FIG. 170 S.

ciple. The two stripes which illustrate the structure of the clusters of diamonds are also on the drop principle and are marked U; while the four plain stripes are marked V. In the latter sections, the heavy threads, which form the edges of the plain stripe, are marked in solid, and the design as shown starts in the middle of one of these plain stripes. Each broad stripe occupies 40 threads, while each of the plain stripes contain 6 threads. It will be seen from the design that all the figures are developed by the filling.



When the design is drafted to the lowest number of harnesses as shown at R, Fig. 170, 32 are necessary, and the weaving plan is complete on 32 by 30 as illustrated in Fig. 170 S. Since considerable more than half the number of threads are on two harnesses, it may be advisable to increase the number for the plain portion, and also to knit the harness to the pattern. When reduced to its lowest number, the draft is very irregular, and would cause much trouble to the weaver. Under the circumstances it would probably be best to weave the cloth in a jacquard loom.

(*To be continued.*)

Safety First Switchboards.

One of the essential features of apparatus used for the control of electrical power is that it must afford a high degree of safety to any who may have occasion to handle such apparatus.

With the end in view of producing aparatus to meet "Safety First" requirements, the General Electric Company of Schnectady, N. Y., has developed two distinct types of switchboard equipment. One of these types is known as the

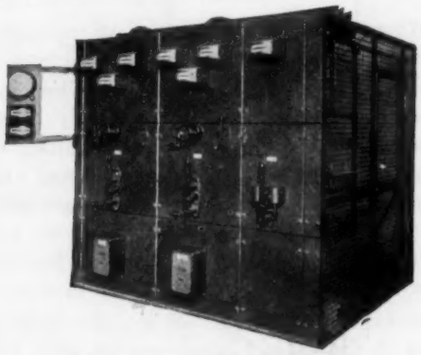
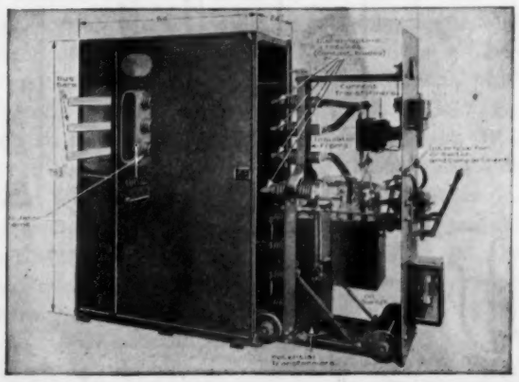


FIG. 170. DEAD FRONT SWITCHBOARD.

removable truck type, and the other is known as the dead front type. The applications of this equipment to power and lighting service are practically unlimited.

The removable truck type of switchboard has a particular application to industrial plants where continuity of service is of prime importance and where inflammable material is used



REMOVABLE TRUCK SAFETY-FIRST SWITCHBOARD.

extensively. All live parts are enclosed and entirely out of reach of the operator. All interior parts are accessible for repair or inspection only after the circuit has been opened by the opening of the circuit control device. Because these units may be substituted one for another the possibility of costly service interruptions is avoided by having one reserve unit. Additions to an existing installation can be made easily and the units may be moved from one location to another without dismantling in any way.

The removable truck carries the panel, oil circuit breakers, instruments, transformers and other appliances of the ordinary switchboard panel. The stationary housing, which is constructed entirely or iron, contains the bus compartments and busses, also the contacts between the busses and the apparatus on the truck.

The dead front type of switchboard is for alternating current service and, as the name implies, no live parts are accessible from the front of the board. The back of the switchboard is enclosed in grille work with hinged doors on each side which are provided with locks so that only authorized persons holding the key may have access to the back of the board. This type of switchboard is for general power and lighting service on circuits up to 3,500 volts, 25 to 60 cycles.

When peace comes the natural inclination of all the warring factors will be to recover the gold and securities which have been sent to our shores. This can only be done on a trade basis which will intensify competition from Europe in seeking markets in our ports. We must plan to protect ourselves against these unusual circumstances by installing up to the minute machinery and methods.

Bobbin Builders and Traverse.

BY GEORGE S. BROWN.

A little ingenuity on a carder's part will sometimes help him out of many a difficulty. In coarse mills running white and colored work many changes are often necessary on the fly frames to keep things running as smoothly as possible. Some of the schemes resorted to in such mills are never heard of on fine work. In one of these emergency cases the following idea was put into practice and it worked out so well that it got to be a common everyday thing in the plant.

A 10″ frame was doctored in such a manner that 8″, 9″ or 10″ bobbins could be run on it when desired. In most makes of fly frames the spindles and bolsters are of different diameter on the 8″ and 9″ frames but nearly all makes have the 9″ and 10″ spindles and bolsters alike. If a change of this sort would be beneficial to any carder, even if his frames will not allow of the use of the 8″ bobbin, he can change from 9″ to 10″ very easily. We will suppose that he has a 10″ frame and he wishes to fix it to handle shorter bobbins.

The 9″ bobbins will fit on the bolsters all right but the 8″ bobbins will not go down far enough to rest on the bolster gears. Cut off an inch from the bolster top as shown in Fig. 1 at *X*. This will shorten the spindle bearing in the top of the bolster, but if the spindles and bolsters are plumb as they should be, the bolsters will still outwear the balance of the frame.

Fig. 2 shows the necessary changes to make on the bobbin builder and tumbler. Where the upper and lower jaws of the builder overlap, cut nearly all of this away.

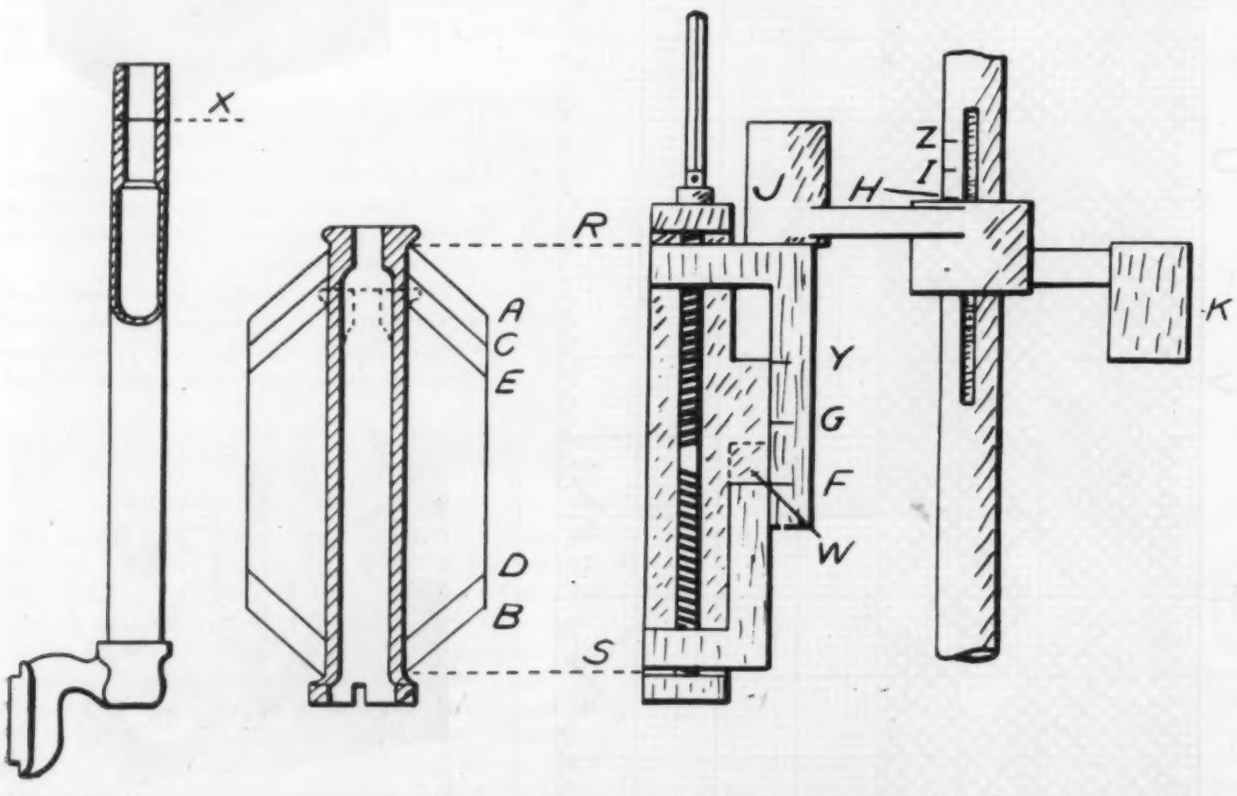


FIG 1 FIG. 2

Be sure to cut it all from the inside jaw as shown by dotted section W. This is done so that when running on 8″ bobbins, a full amount of roving will be wound on the bobbin before the builder jaws close together tightly.

Now let us suppose that we are changing from 10″ bobbins to 9″. After the frame is doffed and the tension rack wound back to the starting point which operation opens the builder for a 10″ bobbin as shown in Fig. 2, disconnect the taper gear which operates the builder. At *F* on the upper jaw of the builder—where the upper end of the lower jaw reaches when a 10″ bobbin is being run—make a mark. One inch above this mark make a second one, *G*. With the taper gear disconnected, close up the builder until the lower jaw just matches mark *G*, as it did previously with mark *F*. Then put the taper gear back in mesh.

Marking the builder jaw removes the necessity of any measuring when making future changes.

The builder set for 10″ bobbins built one somewhat as outlined in Fig. 2 at *A-B*. After the builder is closed to nine inch, if no further change is performed and the frame started, the frame would attempt to build a bobbin as outlined at *C-D*. This would result in the roving being placed a half inch too high on the bobbin and every end would run over the top of the bobbin as shown by the dotted 9″ bobbin tip in the cut. To remedy this, mark the tumbler shaft close against the top of the tumbler as shown in Fig. 2 at *H*. One-half inch above *H* make a mark, *I*. Loosen the tumbler on its shaft and drive it upward until its top matches with mark *I*, as it did at *H*. This will cause the carriage to rise a half inch higher before changing and in this way offsets the effect that closing the bobbin builder produced on the bottom of the bobbin. Naturally, it also lowers the roving at the top and prevents running over. The frame is now ready to start. It will build a bobbin as outlined at *E-B*.

When the bobbins have acquired the correct amount of roving, set the knock-off. Mark the rack where the knock-off is set for 10″ bobbins before changing to 9″ and when the knock-off is set correctly for the 9″, mark the rack for this. These marks make changing back and forth an easy and correct performance without any further measuring. Don't fail to use the marks.

If we can get 8″ bobbins on the bolsters and wish to change for that size, proceed as follows: One inch above mark *G* on the upper jaw of the builder, make the mark *Y*. One-half inch above mark *I* on the tumbler shaft, make the mark *Z*. These marks are the ones to use for the 8″ bobbins.

A few words about bobbin builders may be of benefit. Occasionally, through accident or otherwise, a bobbin builder is removed or thrown out of adjustment. To replace the builder and set it correctly is a simple piece of work, but to the inexperienced it sometimes gives trouble.

If the tumbler, or contact dog as it is sometimes called, on the frame being operated upon is fashioned as in Fig. 2 where the bottom edge of arm *J* is in the same horizontal line with the top edge of arm *K*, the builder jaws should be opened the same distance as the required traverse on the first layer of roving wound on the bobbin. This is shown in Fig. 2 where the builder is set for 10″ bobbins. The dotted lines *R* and *S* show the traverse.

If the tumbler is built as shown in Fig. 3, a different adjustment of the builder is required. In a case like this, the bottom edge of the tumbler arm *L* is not in the same horizontal line as the top edge of arm *M*. To set the builder correctly, open the jaws the distance required by the traverse of the first layer of roving placed on the bobbin, plus the distance 0 in Fig. 3. As an illustration, if the distance at 0 is 2″, then for a ten inch traverse, open builder 10″ plus 2″ which is 12″ in all. After setting the builder, start the frame and closely watch the first and second changes to see that they occur at the correct point on the bobbins. It might be well to state that it is desirable to get as long a traverse on a bobbin as possible, likewise as large a diameter when filling with roving. Length of traverse

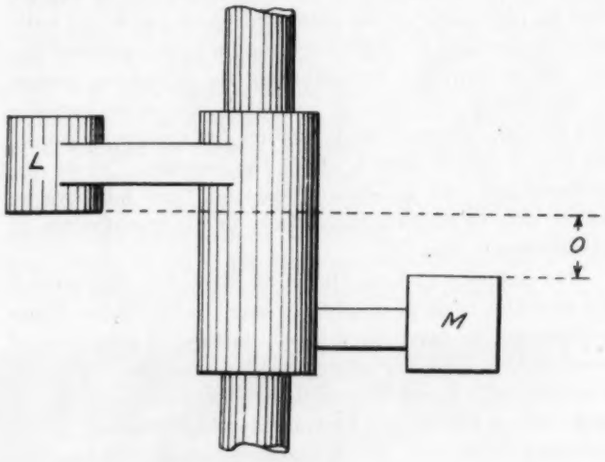


FIG. 3.

will not interfere in any of the following processes but in some cases, if the full bobbins are of too great diameter they do not run well in the creels. By placing every other bobbin upside down in the creel this evil may be overcome.

Setting the builder to get the full limit of traverse on the bobbins will show up any flyers that do not fit down where they belong on the spindles, any pressers bent out of correct position, or any part of the carriage out of level. A bobbin here or there, or a few at one end of the carriage will run over on the first change after doffing when causes as described are present. Keep every flyer and presser in the right shape and keep the carriage level; then it will be possible to get every bit of traverse that the bobbins will take.

The selective draft has called the finest of the country's men. Those who qualified under its workings were chosen for their evident fitness to serve. The principle is an old one; it has been in use in the big industries for building up the structure that constitutes modern business efficiency. In the textile trades it has been a means of placing a Badge of Merit on men and staples in the mill. These items which have shown their fitness to serve are the ones the manufacturer naturally selects for his shops. The special supplies for the textile trade made by The Arabol Mfg. Co., 100 William Street, New York City are found in successful mills all over the country.

Be careful to whom you give advice; someone might take it.

A New Dyestuff Producer.

During the three years of the European war and its complete disarrangement of trade customs and conditions the American dye industry has been so thoroughly established that no combination which it might be possible for German interests to bring about could hope to again control the dyestuffs markets of this country, is the belief of Dr. I. V. Stanley Stanislaus, president of the Stanley Anilin Chemical Works, Lock Haven, Pa., which owes its existence to the war.

Dr. Stanislaus said in an interview in Philadelphia that his belief is based not alone on the substantial footing attained by the industry in the United States, but as well on what he predicts from the successful operation of the anti-dumping law and his confidence that adequate customs duties will be provided for affording the protection needed by the young but thriving industry. He is enthusiastic also over the prospect of legislation for the abrogation of the United States patents of all foe nations. "Write this proposed law into the statute," he said, "and I believe we will be able to compete successfully in the manufacture of phenanthrene dyes.

The company at Lock Haven of which Dr. Stanislaus is the executive head, is supplying phenol to the United States government, he says, for the manufacture of munitions of war, and is shipping other dye intermediates, including dinitrophenol, paranitrophenol, paraamidophenol and ametol. Speaking of the unavoidably slow progress of the company in the face of adverse circumstances, in less than two years since the $2,000,000 corporation was organized the company has reached a stage in its operations where it is able to ship such dyes as wool black and sulphur black, magenta, methylene blue, direct blue, sulphur blue and soluble blue. The latter, according to the doctor, is one of the scarcest of blues, and is commanding around $20 a pound, against $1.75 normally.

Necessarily, as was pointed out by the Doctor Stanislaus, a number of the colors and shades of American manufacture still are in scant supply, and will be pending the abrogation of some dye patents owned by German interests, the ability to get deliveries of machinery and an improvement in shipping conditions. When it came to buying a nitrator for the Lock Haven factory recently, the doctor stated, he was told by the manufacturer that it could not be delivered in less than seventeen weeks. This, he went on, is but one instance of the delays suffered by the company in fully equipping its plant.

The whole class of resorcinol dyes, it was stated, are not being supplied in quantity sufficient to even make an impression on the dyer's needs. These are described as the most beautiful of silk colors, and in the greatest popular demand. There seems little doubt that supplies will be steadily increased; in fact it has been intimated that since so many concerns are producing blacks, which now have become fairly abundant, a number of manufacturers probably will turn their attention to those lines in which the greatest scarcity exists.

When, recently, he appeared before the Committee of Congress which is having hearings on the Adamson bill for abrogating United States patents owned by German interests, Dr. Stanislaus suggested that the abrogation provision be made to apply to all foe-nation-owned patents. The bill is understood to have originated with the American Chemical Society and is being fostered by the American Medical and American Pharmaceutical Associations and the American Chemical Manufacturers' Association. The co-operation of the medical and pharmaceutical associations is regarded as highly important, for the reason that some of the patented synthetic drugs are needful in the manufacture of certain dyes.

The Stanley Anilin Chemical Works may be said to have had its inspiration in several very unsatisfactory tests of a species of black brought out in Philadelphia in 1915. Dr. Stanislaus, then head of the Chasco Chemical Company, passed upon this black, found it unsuited to to the needs of the textile trades and proceeded to produce a black from a coal tar derivative. In this he was successful, and the organization of the company at Lock Haven, already employing about 300 persons, was the outcome. The manager is J. P. Jordan, who it was that installed the operating department of the Lackawanna Steel Company, Buffalo, N. Y., and the Gould Coupler and Gould Storage Battery Companies, Depew, N. Y. L. F. Vinnage, American Car Wheel Company, is first vice president, and Sylvanus B. Nye, president of Nye Park, a suburb of Buffalo, second vice president. The secretary is M. DeWitt Hirst. Arthur H. Hunter, president of the Crucible Steel Co., Dunkirk, N. Y., is the treasurer. The company occupies a number of buildings, in the acquisition of the originals of which it was assisted by the chamber of commerce of Lock Haven, Pa., and is adding to its facilities as rapidly as machinery can be installed.

DAVISON'S TEXTILE BLUE BOOK FOR 1917, 1324 pages. Published by Davidson Pub. Co., New York. Prices delivered, Office Edition $5.00, Handy Edition $3.50, Salesmen's Directory $3.00.

This 30th annual edition shows every mill report carefully revised. Over six hundred new manufacturers have been added, while all those out of business have been taken out. Thousands of changes in mill names, officers, goods made, equipment, selling agents, etc., have been made, and the various dealers and other allied lines have been brought up-to-date. Besides the regular reports, a separate list of new mills is shown. A list showing all mills with dye houses is a valuable feature. The textile maps, showing all towns where there are textile plants or dye works, have been carefully revised. A Canadian textile map has been added.

The Textile Blue Book is really twenty-one directories in one volume as follows: Directory of Cotton Mills; Woolen Mills; Worsted Mills; Silk Mills; Knitting Mills; Jute, Linen and Flax Mills; Canadian Mills; Dyers and Finishers; Mills with Dye Houses; Commission Merchants; Cotton Dealers; Wool Dealers; Waste Dealers and Manufacturers; Mattress Makers; Textile Supplies; New Textile Mills; Classified Directory of Mills; City and Textile Maps. A list of remnant dealers has been added.

A sure cure for a swelled head is to pause and think how many people there are in this world who never heard of you.

Dyeing, Bleaching and Finishing.

Tentering Cotton Piece Goods.

BY WILLIAM B. NANSON.

There are certain classes of cotton piece goods, which must be dried or finished without being brought into contact with the hot drying cylinders. After such goods have been "dressed" they must be tentered to effect the following objects:

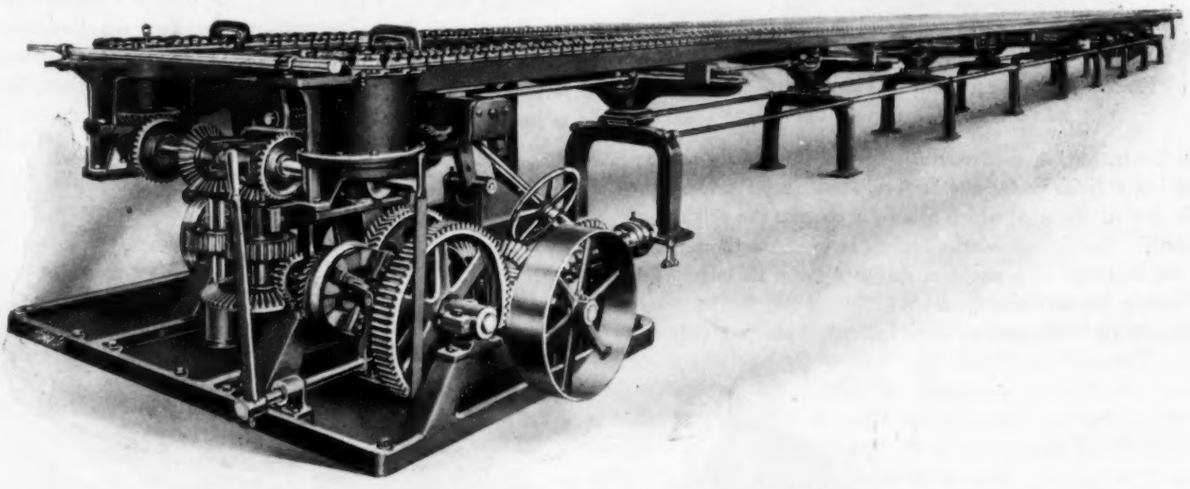
1. Bring them to the desired width.

2. Straightening of the filling threads and fixing the designed pattern.

3. Drying the goods by means of hot air, whilst in this state.

4. Producing the feel, elastic or otherwise, by the application of heat in conjunction with, or, without, a jig or reciprocal motion applied to the cloth.

For this purpose, machines generally known as hot air "tenters" are usually employed. The goods are stretched upon a machine in such a way as to straighten out the threads and produce the necessary width with a minimum of mechanical strain. They are then dried by the means of hot air. By this mode of procedure the fixing of the dressing occurs while the cloth has the desired width and form. In addition to this, by regulating the temperature, and by this means, the rate of the drying, combined with a special reciprocal motion called a "jig" motion, which is given to the cloth, the nature of the finished feel and also the elasticity can be controlled. This effect is caused by the starch being prevented from setting at the junction or crossing of the threads, and causing them to be glued solidly together, at the same time it pulls the threads into a perfectly rounded shape.



AUTOMATIC TENTER MADE BY THE TEXTILE FINISHING MACHINERY CO.

The usual length of a tenter is 90 feet and the output of such a machine is from 30 to 60 yards per minute according to the class of goods being processed. Illustrations of tenters are shown herewith. These consist of the following general parts: The chains, which are fitted with automatic clips; the feeding arrangement; the slides, or chain races, guiding the two chains and their adjustment; the filling straightening motion; the jig motion; the driving gear; the heating arrangement; and the plaiting arrangement.

The Scotch tenter, as it is usually called, is fitted with pin chains, which are usually made to run in a vertical plane. This machine is not a desirable machine but it is cheap to install and that covers a multitude of sins with a "penny wise and pound foolish" purchaser. The chains consist of malleable iron links, each link being fitted with a brass pin plate with one or two rows of small pins. The pins should be made by nickel steel, a metal which does not corrode, and which, therefore, is not liable to mark the cloth with iron stains as would be the case with pins made from steel. The feeding of a pin chain is always done by hand; because no very satisfactory self-feeding apparatus has yet been introduced for "pin" tenters when the "jig" motion is on. Again, the pins on this class of machine are a never ending source of trouble and expense—moreover, owing to the chain being vertical and the lower half being unsupported or only supported in spots, there is a great strain on it and it stretches, and if there is only a difference of one-half inch between the chain on one side and the chain on the other it will pull the threads crooked in such a manner as to completely spoil such goods as ginghams or any goods having a cross over pattern on them. When the chains do get unequal in length it will be found necessary to take both out and lay them side by side on the floor, see that both contain the same number of links, then cut them in two equal parts and link the one-half of one chain onto one-half of the other, this will, or should again bring them both of equal length.

AUTOMATIC FEEDING ARRANGEMENT.

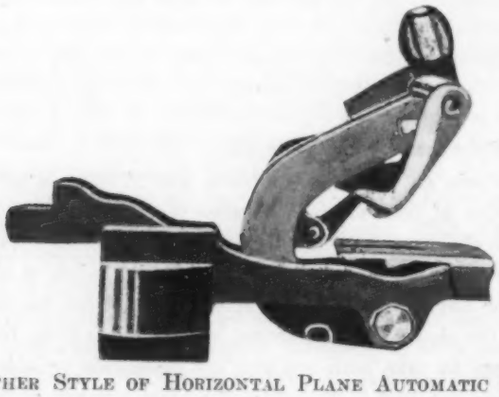
Clip tenters are made usually with self-feeding clips. This clip is constructed of malleable iron links arranged so as to work in a horizontal plane. A brass plate provided with slots is pivited to the body of each link and forms the lower or fixed jaw of the clip. Another brass plate

is pivoted from a pair of arms attached to the links and projecting above the lower jaw. This brass plate, or moveable jaw, when resting with lower jaw at a certain angle forms a powerful grip. This grip becomes tighter the more the cloth, which is being stretched, is pulled. The action of this movable jaw is such, that when it opens inwards there is plenty of room to allow the cloth to enter the clip and when the loose jaw is released it is prevented, by means of feelers located at the back of the link, from gripping the cloth. These feelers correspond with the slots in the lower jaw. They cannot penetrate the clip as long as the cloth

A TYPE OF AUTOMATIC CLIP MADE BY THE TEXTILE FINISHING MACHINERY CO.

covers them, but as soon as the edge of the fabric has released itself from under the feelers, these latter release the upper jaw of the clip, which allows it to grip the selvage of the cloth. The object of the feelers is to cause the clips to hold the material at a uniform distance from its edge without curling the selvages over.

The clips are opened automatically at the entering



ANOTHER STYLE OF HORIZONTAL PLANE AUTOMATIC CLIP.

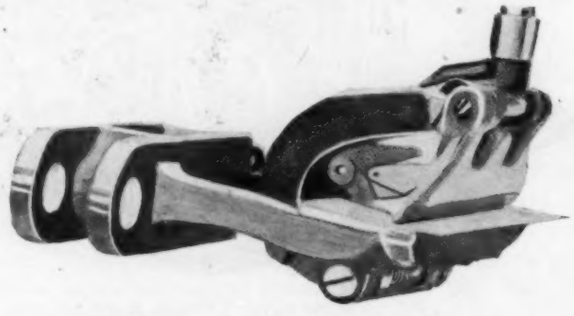
end of the tenter to allow the cloth to enter between the jaws, and as soon as the clips are released the self-feeding action begins. As the cloth leaves the machine, the clips are again opened automatically in order to release the fabric. By using these self-feeding clips, the operative has nothing to do with guiding the material on to the chains, and the work is performed, not only economically, but far more evenly than it would be by hand. There are many types of clip with various refinements of detail, but the description is typical. It is most important to keep the lips parallel and well bedded, or the cloth will suffer from clip marks and curly edges through mis-clipping. It is also essential that the links should come close together, so as to form a continuous line without any break between them, or the goods will be badly clip marked.

A SPRING CLIP IN THE VERTICAL PLANE.

THE SLIDE RAILS OR CHAIN RACES.

The slide rails or chain races are groved out to allow the chains to run easily and are so strapped as to hold the chains in position against the pull of the cloth. At the entering end of the tenter the slides are set at an angle to each other, according to the width of stretch required and the quality and style of the goods. The slides are supported on crossrails which are fitted with right and left-handed adjustment screws. These screws can be worked simultaneously, either by hand or by a special mechanism to increase or decrease the width between the rails so that they can be adjusted to accommodate the various widths of goods.

The front screw is fitted with a disengaging clutch and a hand wheel to allow the entering "angle" to be adjusted



A VERTICAL PLANE AUTOMATIC CLIP.

by hand, so as to be able to take in the variable styles of cloth.

THE FILLING STRAIGHTENING MOTION.

In the various operations of bleaching and dyeing through which the goods have passed previous to the tentering the filling threads become displaced and crooked; more especially is this the case with light goods. If finished in this condition the goods would be unmerchantable. To rectify this defect a filling straightening motion is attached to the tentering machine. This motion is fitted to the driving gear and has the affect of producing a slight advancing or retarding motion to the speed of one of the chains whilst working. This result is obtained by driving one of the chain wheels by means of a differential motion whilst the other wheel is driven direct. The differential is regulated by means of a worm and wheel, placed in a convenient position for the operator of the machine.

THE JIG MOTION.

In a tenter fitted with a "jig" motion, the framing consists of a number of stands placed along the center line of the machine, each supporting a pivoting cross rail on which the chain races or rails are attached. These, in their turn are attached, by swivel blocks to the cross rails and their screws.

The object of the jig motion is to transmit to the chain races an alternate, longitudinal, "to-and-fro" motion at regular intervals, known as swissing or jigging, in such a manner that one chain frame moves forward at the same time that the opposite one moves backward, thus imparting to the cloth held between the chains a movement termed a "jig" action.

This motion is represented diagrammatically in Fig. 1 which is a skeleton plan of the frame work, extending over

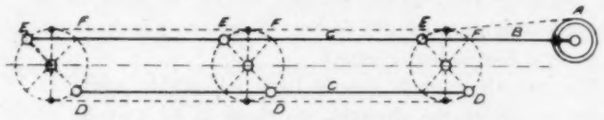


FIG. 1. A DIAGRAM OF THE JIG MOTION.

three brackets or sections of the machine, and showing the eccentric or jig plate *A* and connecting rod *B* which impart the oscillatory movement to the frame.One object of this motion, which is thus imparted to the filling threads, is to insure their straightening out whilst under tension. This action can be more readily understood by imitating the process by hand with a piece of loosely woven muslin, and observing the straightening of the cross threads which occur. If the same experiment be tried on a piece that is starched, it will be noticed that the dressing is affected and the cloth has become elastic. This will go to illustrate another effect of jigging which entirely alters the conditions under which the starch is permitted to dry in contact with the material and how it affects the ultimate finish of the goods.

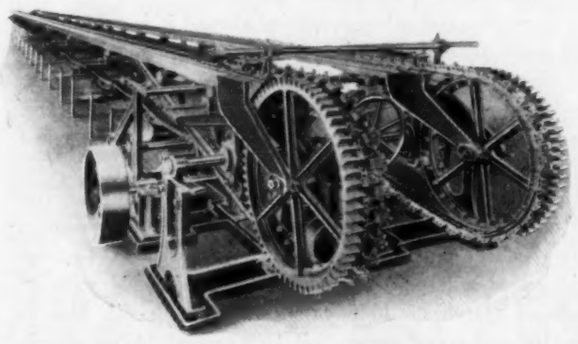
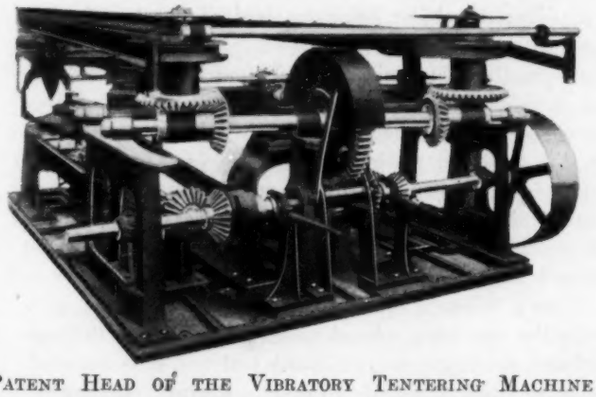


FIG. 2. A TYPE OF TENTERING MACHINE USING AUTOMATIC CLIPS IN THE VERTICAL PLANE.

Returning to the diagram Fig. 1, the circular jig plate or eccentric *A* imparts a reciprocal motion back and forth to the connecting rod *B*; this in turn causes the cross rails *D.D.D.* to oscillate or travel to and fro through the spaces *E, F;* this giving the frame and both chain races the jig motion desired.

While it is quite practicable to impart the jig motion to the chain when it runs in a horizontal plane, it is not advisable to do so if there is work enough to run a vertical chain all the time. The top rail or horizontal chain machine is the most useful for straight away work, but for the jig motion it is not so good, for the reason, that the whole chain being on the top of the rails makes the friction excessive, and also necessitates a very heavy rail to support the chain, consequently when the swing motion is on, it being so top heavy, it causes the machine to rock back and forth on its foundation, and it is difficult to swing a machine of this kind very fast on a weak floor, as the inertia of the reciprocating parts tends to rack the machine to pieces as well as the building which holds it. Therefore, for jigging or elastic finish I would rather have a machine in which the chain swings back and forth in a vertical plane as in Fig. 2. In this machine only about one-half the chain is on the rail and the balance running on pulleys beneath the machine greatly reduces the friction and saves power and vibration. Other illustrations show the various types of straightaway tenters usually used, as well as several styles of automatic and spring clips in both horizontal and vertical plane.

Where the bulk or all of the goods to be finished are for a straight finish with only an occasional small lot of goods for the swiss or jig motion I would put in the horizontal



PATENT HEAD OF THE VIBRATORY TENTERING MACHINE MADE BY H. W. BUTTERWORTH & SONS CO.

type of tenter with the jig motion attached for it must be remembered, that this so-called swissing or jig motion is not only adjustable with regard to rate, and extent of traverse but it may be stopped altogether, and the swivel arms may be brought to the middle position, and the plate *A* disconnected, and the frame locked for straight tentering (see Fig. 1.) On the other hand, where the most of the work is for jigging it might be advisable to install a vertical chain tenter, because this machine can be made to run without the jig motion if required.

It should be remembered that although this motion is required for certain classes of goods only, on which it is required to produce what we know as an elastic finish, it is seldom that a horizontal tenter is built without it, as it does not affect materially the cost of the machine, but it does materially enhance the value of it. Jig motions vary in make-up and construction. They ought, in all cases, to be designed so as to give a varying shake at will and at the same time allow the motion to be readily disconnected so that the tenter can be used either way i.e. with or without the jig motion.

THE DRIVING GEAR.

A tentering machine should be driven by means of a pair of direct double cylinder diagonal or angle engines. By this arrangement of direct independent driving, the speed of the machine may be varied to suit the different weights and finish of the goods undergoing treatment.

THE HEATING OR DRYING APPARATUS.

This usually consists of a multitubular heater, which is made sufficiently large to take advantage of the low pressure exhaust steam from the engine cylinders, which is generally used in the heating apparatus. Air is forced through the heater by means of a powerful fan which is driven by a direct engine. It is then conducted through sheet iron piping to a set of upright pipes fitted with nozzles. These pipes are arranged below the fabric in the tenter along the full length of the machine, and their nozzles are adjustable and set to discharge the hot air under the cloth in the most efficient manner according to the judgment of the operator. A supplementary bank of steam pipes may also be placed in the machine just below the cloth to give extra heat if required.

A thick blanket is hung on each side rail, extending from the rail to the floor. This prevents loss of heat at the sides, and at the same time forces the hot air upwards through the cloth.

The tenter should be placed in a low room in order that the hot air from the heating system may not diffuse too rapidly; the object being to obtain full saturation of the air with moisture before it is suffered to escape. In a lofty room the heated air would diffuse before it had become saturated and this would decrease the drying power very considerably. Should a suitable room not be available, the tentering machine should be cased in except at the two ends and provided with a suitable vent or chimney to carry off the saturated hot air. The casing should be high enough to allow the operator a chance to enter and approach any part of the machine.

When a tenter is combined with a starch mangle, as is always the case when colored woven goods such as tickings, ginghams, shirtings, etc., are being tentered, it is quite advisable to place a set of 3 or more drying cylinders between the two machines in order to partically dry and set the wet starch before it is fastened to the chains. These drying cylinders are driven in combination with the starching mangle, which in its turn is driven by means of a pair of direct, double angle engines. This is a very valuable addition to a tentering machine and with proper manipulation it may be made to double the production of the tenter and also double the stretch of the goods.

The writer always contrived to stretch the goods enough to pay all the costs of finishing, i.e. when he had his own way about fitting up the plant. I have no patience or use for the small starch box and two rubber rolls sometimes placed behind and in combination with tenters in colored mills for finishing ginghams, shirtings, etc. This arrangement permits of no pressure being exerted on the goods, and the starch is all deposited on the surface of the goods and does not hold, moreover it wastes starch, steam and time as the goods takes longer to dry when plastered thick with starch on the outside.

DELIVERY.

The delivery from the machine is by means of a plaiting down arrangement, the draw rollers of which are geared to travel at the same surface speed as the chain. It is not good to wind the finished goods on to a roll by means of a batching belt or roller. Either of these must of necessity run faster than the tenter, and if the goods are soft, or light in weight it will pull in the width and make the goods too narrow.

The mechanical conditions necessary for good tentering are: (1) A good type of clip which affords a wide opening to assist feeding. (2) Accurate bedding of the clips in the chain race so that their lips are horizontally in line and the gaps between consecutive clips very slight. (3) The spacing for the rivets and correction for unequal wear is of the first importance, as, although it would seem obvious that the cloth must proceed accurately through the tenter if it is fed in straight, and the speed of the chain wheels is uniform, this does not by any means follow. If the clips are not spaced quite equally, the travel of the selvage will gain on that side at which the chain is slack. (4) An ample supply of hot air, which can be provided by a low pressure, high volume fan, if the passage through the heater duct, and funnels be well proportioned. A steam-heated tubular heater with copper tubes gives the best results. The heating surface should be such as to yield a temperature of 180 degrees F. at two 4-inch outlets for every 6 feet of tenter length.

The hot air funnels should have adjustable cowls arranged to direct the draught, or check it as may be required, onto the cloth according to the finish desired.

Goods that are woven double width with a double central selvage, can be torn in two by threading the two halves in opposite directions over guide rollers as they leave the machine. This is a cheap and convenient method of finishing low-grade turkish towelling.

Even the best system of tentering is still far from being perfect, especially as regards the "elastic" finish. In the tentering machine fitted up with a pin chain, the action of the vibrating motion takes place from one pin point to the other, it follows from this, that on the width of the cloth the diagonal of action advances to the real line which represents the fabric, whilst with the clips which are from 4 to 6 inches long, the line of action is much stronger, with the same movement, and in the space between the two clips a frayed appearance is sometimes produced.

In Germany and other countries abroad it is customary to put more time, labor, and material into finishing processes than is done here. Finishing is an art there, while here—well the less we say about it the better—any way. abroad it is customary to tenter all shirtings, i. e., bleached shirtings and the process is something like this:

After bleaching, the goods are heavily mangled and dried on the cans. They are then starched on a common two bowl starch mangle fitted with levers, with a 14-pound weight on each lever. The starch may be made with 40 pounds of starch on half gallon of soluable oil, blue to shade, 100 gallons of water, boil 10 minutes. After starching, the goods are run direct on the tenter without the jig motion. They are stretched to width on this and after running are allowed to cool (this is important). They are then lightly conditioned on the sprinkling machine and allowed to lie for two hours and are then folded up if for "muslin" finish. All classes of white shirtings are finished with modifications of this method. The modifications consisting of more or less starch with additions of China clay and other weighting materials on the starching end of the process and various different methods of light or heavy calendering on the finishing end of the proposition.

Victoria finish is produced by first heavily mangling the goods on a wooden bowled water mangle in *boiling* water. Then calendering dry on chasing mangle once

round; then stiffened with the best wheat starch at about 10 degrees Tw. and dried on the tenter with the jig motion. Lawns are finished this way and the starch can be modified in many ways to suit all tastes.

DHOOTIES.

It is possible that after the war a great export trade may spring up in this line of goods. Dhooties have colored borders and selvages and have to be specially bleached and finished to prevent the colors from marking off. They must be run from the mangle direct onto the tenter as they will mark off if rolled or batched up wet. These goods are generally given a pure finish. After bleaching they are mangled through *warm* water on a 5 bowled mangle, dried on the cans tentered to width and lightly calendered; or mangle through *hot* water on 5 bowled mangle, starch at 4 degrees Tw. on wooden bowled mangle, dry on cans, stretch to width and straighten on tenter, damp on sprinkler, let lie two hours and calender with mahogany rolls without pressure. As it is the great essential to finish these goods as wide as possible, some finishers dry these goods altogether on the tenters.

SATIN STRIPES.

These have usually an elastic finish which is got as follows. Mangle in *hot water,* starch on regular two or three bowl starch mangle, dry on cans, damp well on sprinkler and let lie two hours, then tenter cold with the jig motion, afterward give a light calender. Use about 60 pounds of corn starch to 120 gallons of water when starching these.

LIGHT BLEACHED GOODS.

All light goods such as checks, lawns, curtains, etc., must be finished on the tenter because regularity in width, straightness of pattern and thread, softness and elasticity of the finish are essential. The usual proceedure is: Mangle *cold,* dry on cans, calender lightly, starch, tenter, calender lightly if necessary. The tentering is done with the jig motion on. This class of goods is often starched with wheat starch. One of the best finishing substances for woven colored dress goods, such as plaids, coarse ginghams, etc., all of which should be finished on the tentering machine, is epsom salts. A good deal of weighting can be given by salts, and the amount can be regulated easily by the finisher, sulphate of soda (Glauber's salts) can be mixed with them. A nice soft finish can be obtained, which will add four pounds in weight to a piece of four-yard plaid, by passing the goods through a solution of epsom salts at 40 degrees Tw. and then tentering. A 10 degrees Tw. solution will add three-fourths pound to the same piece. Epsom salts gives a nice finish having a very full crisp feel.

Epsom salts is used as a stiffener, and also for giving weight. The amount of weighting depends upon its specific gravity. A solution standing at 60 degrees Tw. will add about five pounds to the weight of a piece of cotton plaid or ticking. It is also a good finish for domets. A solution of 26 degrees Tw. will add about two pounds to the weight. 25 pounds of epsom salts will make about 50 gallons of solution, standing at 55 degrees to 60 degrees Tw. It easily penetrates the fibres of the cloth, and it crystalizes on drying, this has the effect of expanding the fibre and giving to the cloth a thick and substantial feel. It can be used for every description of goods, whites, solid dyed colors, woven colored goods such as plaids, tickings and shirtings. Unlike starch, epsom salts have no deteriorating influence on the colors. Nitre cake and Glauber salts can be mixed with epsom salts to reduce cost, but if nitre cake be used it must first be carefully neutralized.

When finishing colored goods it is very important that the brilliancy and solidity of the colors be not impaired and such bodies as china clay, and mineral white, should be used as sparingly as possible, if at all. They lie on the surface of the goods and hide the color. Preparations of starch and flour have the same fault in a somewhat smaller degree. Dextrine, epsom salts, sulphate of soda and starch that has been made soluable by means of Diastofor are transparent and all starch or weighings for colored goods should be made from these whether intended for tentering or can finishing.

In England and Germany most woven colored dress goods for export are finished by mangling the goods through epsom salts at 40 degrees Tw. and drying on the tenter, the Germans using kieserite which is an improved epsom salt. Ticking finished in this manner is greatly improved, though the proper finish for ticking is a clay filling put all on the back, so as not to interfere with the color on the face of the goods, this is applied by a back filling machine at the back of the tenter—the goods passing directly from it onto the tenter. By this system the cloth is entirely filled without showing any starch on the face and a piece of ticking weighing 4.75 yards per pound from the loom can be stretched 6 per cent and finished to weigh 2.75 yards to the pound.

America's Dye Industry.

BY JAMES A. BRANEGAN.†

Numerous American dyestuff consumers have frequently stated during the last twelve months that, while they get all the dyes they require, they cannot get the exact dyestuffs they want, or that certain American-made dyes are not fast to light and, therefore, the American chemist is not in the same class with the chemist of Germany. These misunderstandings are due to two facts, the first being that the ordinary consumer is not conversant with the coal-tar industry, which is based on a succession of products, and the second fact is the impatience of the American manufacturer. Perhaps it is a combination of both, as the American manufacturer does not care for explanations, and if he cannot get what he wants when he wants it he condemns the engineer and the chemist.

The dyestuff industry in this country, from the consumers' standpoint, is centered in Philadelphia, the field extending south to the Carolinas and Georgia, where cotton dyehouses predominate, west to Chicago, north through New Jersey with its big silk mills, on to New England, where

*Extract from an article in the Philadelphia Public Ledger.

†The author of it is one of the most widely known chemists in America, particularly in the textile industry. He studied inorganic chemistry for five years at Pratt Institute, Brooklyn; then with four other chemists took a two-year course in dyestuff and organic chemistry under Doctor Langmuir, of New York. For sixteen years he has worked among the dyehouses of this country, and until recently he had full charge of the output of what is regarded as the sole real intermediate plant in this country. In 1911 he was made the recipient of the Wildman Medal for original research. He is chairman of the membership committee of the American Chemical Society, Philadelphia Section, and holds membership in the Society of Chemical Industry of England: Chemists' Club, New York: Engineers' Club, Philadelphia, and Chemical Alumni Association, Pratt Institute.

wool is supreme, while Philadelphia itself consumes more dyestuffs than any other city in the world..

It has been the writer's privilege for the last sixteen years to visit the various dyestuff consumers in this vast territory, both as a chemist and as the technical representative of a large chemical concern making chemicals allied to the textile industry. Now when the dyers are getting all the American dyes they want, we still hear the complaint about quality and fastness to light, and the supremacy of the German chemist, and unless the matter is explained carefully and thoroughly and in simple language, the complaint seems justified.

It is not my intention to go over the dyestuff situation since the war broke out, as we are still more or less familiar with the details, but a brief recapitulation is necessary to make plain what follows. First, we had the sudden stoppage of dyestuffs and soaring prices; then the clamor for old-time dyewoods and extracts; then a few American coal-tar colors by the real "live wires." At this period the consumer offered no complaint on American dyes, but took anything offered. If a coal-tar yellow turned out to be an orange, all well and good; the dyer used it for orange.

This period was emphasized by the hundreds of small concerns started by chemists who had "discovered" the "secret" of the German dyes and who had not the least trouble in getting capital if they could produce a color of some sort. Most of these concerns failed months ago. To the chemist who is familiar with the subject this period was the biggest surprise of all, as there are absolutely no secrets in the dyestuff business, virtually all patents having expired, and few colors have been developed in recent years. To such a chemist, if he has studied his organic and coal-tar chemistry, it is only a matter of "intermediates," and it is in that word "intermediates" (which to the ordinary citizen means nothing) is due the "long chase," the finish line of which we are now crossing.

The dyestuff industry is based on a few "crudes," such as benzol, toloul, xylol, etc., which are simply and easily separated from the tar distillation, and from these are manufactured the "intermediates," of which there are only about seventy-five, and fewer than this number are really important. From the intermediates the many thousand coal-tar dyes are made. At the outbreak of the war no intermediates were made in this country, and as each intermediate means a separate plant, sometimes covering acres in extent, and special apparatus, they could not be made in a night.

The simple intermediates, like anilin oil and toluidin, had to be made, and from these higher intermediates, like dimethylanilin, were developed, and each higher intermediate itself needed a separate plant. From these higher or last-developed intermediates the later or newer dyes are made. Thus it can easily be deduced that the simpler intermediates, such as anilin oil and toluidin, had to be made first, and from these, to supply the need of immediate relief, dyes of the earlier type were produced in large quantities. Some of these dyes were considered of great merit thirty or forty years ago, but of recent years have been replaced by faster colors, such as anthracenes, alizarins, indanthrenes and direct colors. As it takes six months to a year to build an intermediate plant, it would not do to let the simple intermediate plants stand idle and wait for the further building of the higher intermediates plants. Therefore, the dyers in 1915-16 were supplied with dyes mostly of a type of twenty or thirty years ago, but generally the trail was followed up. Higher intermediates, such as "H" acid and alizarin, are gradually being produced from lower intermediates, and one concern is making 5000 pounds of synthetic indigo per day, so that before another year has passed we will not only have all the dyes we want, but also the exact dyes we require, and our plants will equal the dyestuff plants of Germany, which themselves are but a succession of intermediate plants, built gradually over a period of fifty years.

There was no other method of solving the problem, no short cuts. It had to be a stern chase and only those who know what the task meant can understand the immense amount of work that has been done. There was virtually no apparatus in the country suitable. Factories for heavy enamelware, acid-resisting metals, potteries for ware that would stand heat, and other special apparatus had to be built. This has all been accomplished in the amazingly short time of three years and there is absolutely no question of the permanency of the American dyestuff manufacture.

At the present writing probably about 70 per cent of the dyes being made and used in this country are satisfactory and suitable for the purposes to which they are applied. The other 30 per cent are used in place of the higher grade dyes which will shortly be on the market, and with the appearance of these dyes the finish line will have been crossed and the race ended. Then watch the American chemist develop new dyes, and after the war it will be Germany who will do the trailing.

A word regarding quality in answer to those who claim American dyes are not the same as the imported. There is no question as to the dyes now made being equal to those of Germany. All dyestuffs are of definite and standard composition. Just as water is H_2O, meaning two parts of hydrogen and one part of oxygen; and sulphuric acid, H_2SO_4, being two parts of hydrogen, one part sulphur and four parts oxygen; and epsom salts, $MgSO_4$, one part magnesium, one part sulphur and four parts oxygen; so naphthol yellow (a well-known dye) is $C_{10}H_4(NO_2)_2SO_4K_2$ meaning ten parts of carbon, four parts hydrogen, two parts nitrogen dioxide, one part sulphur, four parts oxygen and two parts potash—and whether made in Germany or the United States of America the final product is exactly the same.

As to the misunderstanding regarding the American chemist and the former popular belief in his inferiority in the dyestuff line this is easily understood. It should be noted that chemistry is divided into two distinct branches, organic and inorganic, and in Germany the principal and most important industry is the making of dyestuffs (which is organic chemistry.) Most German students in chemistry after graduation seek positions in coal-tar plants, as there are no mines in Germany and, therefore, less call for general chemists of the inorganic line. The universities naturally cater to the desires of the students and the wants of the country and therefore the principal courses are organic chemistry, while the shorter courses are the inorganic.

In this country it is exactly the reverse. We had no dyestuff plants, but did have large industries of every other line, most of them requiring inorganic chemists. We

called for technical men for our copper mines and refineries, iron works and for heavy inorganic chemical plants. Therefore, the demand being for inorganic men, our universities and technical schools taught mostly inorganic chemistry and our chemists averaged higher than the Germans in this branch of the science. Nevertheless, Americans who took up organic and dyestuff chemistry in former years had not the slightest trouble in mastering the science, and I recall that one of the chief chemists in the largest dyestuff plant in Germany for a number of years was an American.

Not only have we crossed the tape in the dyestuff line, but we have actually gone ahead in the working of vegetable oils (another branch of organic chemistry). Before the war all high-grade soluble oils for textile work were made from castor oil, mostly from Germany, and known as monopole oils (a German patent), or made in this country from imported castor oil. Today one Philadelphia concern is making a hydroxy oil which is made on an American process from American oils exclusively and is superior to the heretofore imported product.

The writer is not connected with any dyestuff manufacturing concern and in writing this article was prompted by a desire to explain in simple language the perplexities of the organic chemistry situation, and if he has accomplished this, he is amply rewarded.

Foreign Methods of Mercerizing.

BY RAFFAELE SANSONE.

When the boiling out process is carried out before mercerization it is necessary to reduce the consumption of steam and labor to the lowest degree. This is only possible through the use of the most modern machinery, and the adoption of all those economical applications that can contribute toward assisting in and reducing the price of the treatment.

With yarn the boiling out process is carried out more rapidly than with cloth, as the former very seldom contains other impurities than those already present in the raw material before the spinning, and these are not difficult to eliminate. The treatment, although in both cases equal, should therefore be shorter with the first than with the second.

The boiling out of cotton yarn or cloth takes place generally in large closed iron boilers, or kiers, where the material is treated in chain or other convenient form under a certain pressure with hot alkaline liquids, which are made to circulate either by the action of steam, or with a centrifugal pump. A type of kier working only with steam consists of a strong iron boiler, supplied with a heavy cover of equal metal which may be tipped back on a pair of strong hinges which can be raised or lowered by a special chain. A series of clamps permit the fitting of this cover to the body of the boiler, and towards the lower portion of the latter a double bottom and a steam coil for heating the bath are placed, which permits of a uniform infiltration or circulation through the material and a regular boiling of the lye.

The circulation of the hot alkaline liquor is induced in this instance by means of a long iron injector, into which the liquor is drawn through a perforated cone by a jet of steam shooting upwards, and is then sent out on the goods at the top of the boiler in the form of a shower. Outside the boiler, and just below the injector, a tube is fitted terminating in a tap, that permits the drawing out of the liquid at any time; while on its upper portion three small taps are placed for verifying the height and condition of the liquid. Above these another tap of somewhat larger construction serves for drawing out the liquid when this is too high in the boiler; which is sometimes caused by the entrance of too much condensation.

This style of kier, although giving excellent results when properly worked, is however only useful for small productions. When large quantities are to be worked, kiers in which the circulation takes place through a centrifugal pump are to be preferred, as the same results are obtained by this means in much less time and with a smaller employment of steam and labor. In this method two kiers are coupled to a single pump in order to economize to the utmost extent in the steam and motive power expenses. This pump draws the liquid from the bottom of the kiers as it drains down through and sends it either to one, the other, or both of the kiers as the valves placed on the pipes leading to them are opened or closed.

The liquid, when coming out of the pump, is not cooled in any way as the pipe delivering it upwards is of a spiral shape towards the middle, and this spiral is surrounded by a long cylindrical iron case in which steam circulates, a sort of superheater, in other words. This not only keeps up the temperature, but also avoids in many cases the necessity of using a heating coil in the interior of the kiers themselves.

Each kier is furnished with specially large openings on the upper extremity, permitting entrance for the packing or placing of the material, that can thus be very regularly and rapidly carried out by utilizing all possible space. The pressure in the interior of these kiers can be checked at any time through pressure gauges, placed on the upper portion of the covers.

When the goods have been subjected to several hours boiling in the kiers and the hot alkaline liquid has been run off, the tap at the bottom of each kier is closed, and the kier filled with boiling water. Then the tap is again opened, just sufficiently to permit the hot water that enters from overflowing at the top of the kier. This rinsing is continued until no more size is found in the waste water. The hot water is then replaced with cold water that is run in for cooling down the kier.

If the water used is sufficiently warm the majority of the size and alkaline liquid still contained in the material is extracted. Should this not be the case, or if the supply of hot water be too small, when the hot lye has been run off cold water is run in until the material is cold, after which the goods are taken out, and submitted to special rinsing operations.

These rinsing operations take place differently as the material is in the form of yarn or cloth. In the case of yarn in the form of hanks, these when coming from the kiers, are either rinsed in chains or divided and treated as hanks. Hanks are treated on a special apparatus, that conducts the rinsing more rapidly than would be possible by using the ordinary dye vats and carrying out the work by hand.

An apparatus which seems to have received considerable attention for the rinsing of this form of yarn consists of a U-shaped wooden tank or trough furnished with a series of radial, horizontal arms, for holding the yarn immediately over it. The axes of the radial arms are fixed, at equal distance, to an endless chain which passes round two large pulleys. The square reel of each arm revolves loosely on its central axes, the end of which rests on the outer edge of the trough. At the end nearest the chain each reel has a fixed wheel or pulley. The rails on which these pulleys rest receive a vigorous to and from movement transmitted by a crank shaft, and this causes the reels to revolve rapidly to right and left alternately, and the hanks to vary their point of suspension. By the revolution of the two large pulleys, actuated by an endless screw, the radial arms receive a rapid and continuous progressive movement. On reaching a certain portion of the machine, the washed hanks can be removed and at once replaced by others ready for washing. These enter the trough in a direction that is contrary to that followed by the water on entering. The machine is made of sufficient size to permit the washing of the hanks in only one passage through the trough.

Another form of apparatus consists of a large circular tank, so constructed as to contain in the middle an open space that is closed all round. In this space a special mechanism is fixed that works a certain number of square shaped arms of wood or iron. These arms besides possessing a backwards and forwards movement receive also a progressive circular movement, and these movements are slowly transmitted to the hanks while traveling through the bath, and they are treated in nearly the same manner as if worked by hand.

In some works it is usual to wash the hanks, while they are still linked together in the chain form, on the ordinary warp washing machines. In such cases however the upper cylinders of the machines are covered with a layer of thick rope, and only rest on the material by their own weight. This is important, for the irregular thickness of the chain of hanks in passing rapidly through the machine requires a certain elasticity. With pressure produced through levers and weights, or screws, a similar elasticity would be impossible, for during the entrance of the linked portions of the yarn between the rollers a too severe squeezing would take place which would break many threads.

The construction of the machines for washing cloth in rope form or warps of yarn varies somewhat in different works. In some mercerizing concerns a double washing machine is in use working on the principle illustrated in Fig. 1. The material enters in this case, through the squeeze rolls *P*, in running water, and is guided by means of the small wooden rollers 1, 2 and 3 to a square wooden shaft *S*, revolving on its axes. This performs a continuous beating action that assists greatly in the washing. On leaving *S* the chains of material pass under the central shaft *T*, being led to another square beater *U*, and again taken through the bath over the guiding rollers, 4, 5, and 6. From these the chains pass out of the machine through the squeeze rollers *Q*. In some machines several chains can be treated simultaneously and the production is fairly high.

Another machine for washing out purposes has been introduced in many establishments which is said to carry out

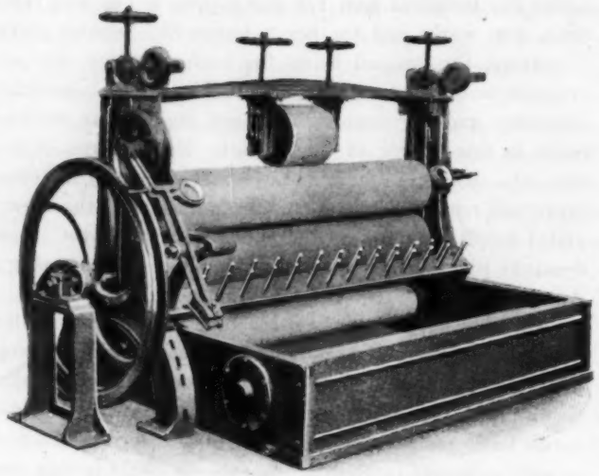


FIG. 2. ANOTHER TYPE OF WASHING MACHINE.

the washing more thoroughly; the production in this case is however not as high as with the preceding machine. The working principle of this machine is to be seen in Fig. 2. Here the cloth enters at one extremity and is led several times from the liquid to the large pair of squeeze rolls, making its exit at the opposite end. The chain is kept in this case in its corrected position by a wooden frame or racket, also to be seen in the figure. This machine has an advantage over the preceding machine because the material is squeezed between each impregnation causing a more thorough rinsing.

The rinsing after the boiling out process is sometimes followed by a souring, that takes place in an apparatus of similar construction to those used for the washing. After the souring a thorough rinsing is however necessary and this lengthens considerably the process. The souring is to

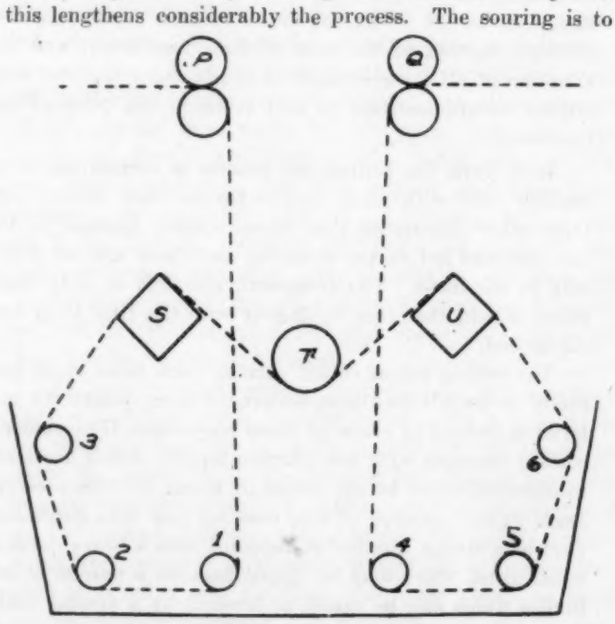


FIG. 1. A TYPE OF DOUBLE WASHING MACHINE.

be recommended especially when substances have to be removed that cannot be extracted with the boiling alkaline treatment. When these are not present it should be avoided altogether. For this reason its necessity should be passed on in each case by the chemist and no batch of material treated until his advice has been given.

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After the rinsing, or souring and rinsing, the next operation is the expulsion from the material of all possible water, that would only dilute uselessly the mercerizing baths, by using hydroextractors, or by simply passing through squeezing rollers.

With hanks in chain form, these are broken up and each knot of hanks is placed in the cage of a hydroextractor, and the latter worked till all possible liquid has been expelled. Should the yarn be in the form of warps these are also treated on the hydroextractor after the plaiting that has kept them together during the boiling out process has been undone. With cloth the wisest plan is to open out the material and pass it in full width, taking care to avoid the entrance of creases, through the nip of a pair of squeeze rolls, the upper one of which is of rubber. This is quite sufficient for liberating the material in one passage of all water. When the cloth has been rinsed in full width a similar squeezing operation can be avoided altogether as on coming from the rinsing machine it has already been squeezed.

There is no doubt that in the near future the boiling out of the goods will either be done away with altogether, or much reduced, by special arrangements made between all parties interested. In this case by freeing the raw material of all natural impurities before the spinning, and adopting special sizing mixtures during the preliminary operations of weaving, that can be more easily removed than at the present, and still act equally well for the protection or strengthening of the threads during their passage on the loom, the mercerizer will only have to remove these ingredients by a simple passage through boiling water.

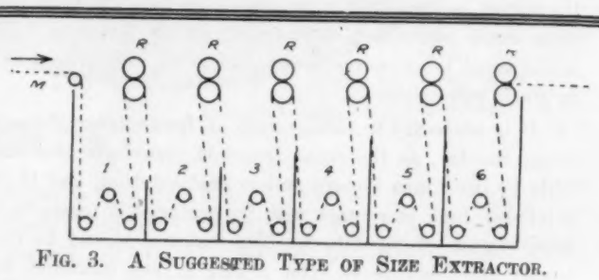

FIG. 3. A SUGGESTED TYPE OF SIZE EXTRACTOR.

This passage through boiling water will then most likely be conducted on a very simple apparatus constructed on more or less the following principle, and permitting a much more rapid and continuous treatment than is possible even with the very best of kiers:

Figure 3 represents a long rectangular iron vat *V*, where the material *M* is treated in succession through the compartments 1, 2, 3, 4, 5 and 6, which begin with low and gradually rising partitions until they reach the opposite end of the vat. In this machine it is simply treated with boiling water that enters at the back of the apparatus and escapes on the front, so as to facilitate the expulsion of the size. The cloth is taken up at regular intervals by the squeezing rollers *R*, and these by continually pressing out the liquor not only guarantee a thorough penetration, but also oblige the solution and consequent expulsion of the size. The material could then be passed directly on to the mercerizing plant, thus saving in the time and labor required.

The most convenient substance that can be used for the sizing of the warps in this case would be dextrin. As this substance is fairly expensive its recovery from the wash

liquors would be advisable. This could be accomplished by collecting the liquor coming from the front of vat *V* in large wooden tanks and concentrating through special evaporators to the consistency of a paste, that could either be used for sizing, or sold in tubs to neighboring works or weaving sheds.

Even avoiding the recovery process, the adoption of dextrin in the place of the usual starch, or starch and moss thickenings, generally used for warp sizing, might also come cheaper in the long run than the lengthy and costly boiling out processes necessary when these latter substances are used.

The expulsion of the natural impurities before the spinning is a simpler operation than many may think. The advantages of thus cleansing the raw material are of great value to the mercerizer of first-class goods. The first who would gain advantage would be the spinners, through having their raw material free from extraneous substances, could reduce the number, or intensity, of the operations at present employed; and there would in this case be a fair reduction in the number of broken fibres. Besides this the yarn, or cloth, manufactured would be a fine white and the few impurities acquired during the process of spinning and weaving could be easily eliminated with a simple passage in boiling water.

The elimination of the impurities contained in raw cottons by the fermentation process does not appear to have yet been tried anywhere, and as it would not be convenient to await the necessary time required by this process, it would be possible to quicken the fermentation by keeping the cotton immersed in large stone vats that has been filled with water containing substances rich in ferments. This would cause more energetic reaction on the fibres, especially in warm countries,

It is necessary in this process of fermentation to avoid going too far, as the same ferments transform the water little by little into a more or less acid solution, and if this is left too long in contact with the material it reacts to the deterioration of the fibres. The material should be thoroughly freed before or after drying of any substance that can act deleteriously and which, if left in the material, might cause weakening or the formation of mildew. This can only be avoided by submitting the cotton to a very thorough washing in clean running water.

As it is not possible at present to obtain a raw cotton that has been freed of its impurities as mentioned, this freeing could be conducted in the mills, and the fermentation process substituted by a boiling with an alkaline carbonate, which if more expensive than the fermentation would always be of convenience, owing to the great number of advantages it causes. This treatment with the alkali could take place in special apparatus where the material is charged in iron cages, and the hot akaline liquid is made to circulate under pressure by means of a centrifugal pump.

The elimination of the impurities is rapid, and if the material is afterwards dried until it contains a certain fixed percentage of moisture, which can be easily regulated by the use of special machinery, it is possible to spin in the finest counts, even in warm countries where the atmosphere is excessively dry, without having recourse to humidification.

The machinery necessary for the treatment of the material used in a modern works would not be very expensive, and could be furnished with small boilers using only limited quantities of coal, or working with other fuels. Mills equipped with a plant could place at the disposal of the mercerizer better articles than are at present possible.

Some mercerizers dry their goods after the final rinsing following the boiling out. A method of proceeding, however, scarcely to be recommended for various reasons. During the souring and washing out process, either through the thickness of the cloth or through insufficient washing, small traces of acid might have been left and this would undoubtedly tender the goods during the drying. Moreover the drying process, however cheap or abundant the steam may be always constitutes a certain expense, that is somewhat increased by the labor necessary for the handling of the goods. For these reasons drying should only be resorted to when it cannot be avoided, and when it is undertaken on yarns that have been soured, the last rinsing following the souring should contain a weak soap solution which will stop any tendering.

If the goods have been freed of all natural impurities before the spinning and contain an easily soluble size they could be treated from the start in full width by entering first in the singeing machine and then running straight through the size extractor, illustrated in Fig. 3, and the mercerizing plant. In this manner the singeing, size extraction and mercerization would be carried out in one run, without requiring any intermediate stoppage or manipulation on the part of the workmen.

We hear a good deal these days about "our first line of defense." Physically, no doubt, this is our navy, but we venture to express the opinion that this nation's first line of defense just now is back of both navy and army. It runs through our homes and offices, our stores and factories; it touches our pocketbooks. Its name is "Thrift."

Thrift is a better word than economy or frugality. It is an alert, active, aggressive economy. Thrift is economy plus industry. One may practice economy with what one has without adding to one's store, but the practice of thrift not only protects what we have, prompting us to use it wisely, but adds to our possessions through active and efficient industry.

Thrift, like all our other defense lines in the present national emergency, is much in need of strengthening and extending. It is the line in which every person, old or young, in the country ought to enlist without delay; for the time may not be far distant when "universal service" in the way of training in thrift shall be a matter of inescapable law.

Each one of us may serve the country's most urgent needs by saving. We may eat less, drink less, smoke less, spend less on clothing, less on luxuries, less on costly recreations and social dissipations, not only to the country's great advantage but with distinct benefit to our own physical and mental well being.

We owe it to the cause this nation has undertaken to champion, to practice *now* the most intelligent economy in all things that touch us personally and to encourage this practice in others by precept and example.

Get into this first line of defense. Give to this great international cause the incalculable aid of rational self-denial.—*The American Outlook.*

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Our experience has proved that a roof laid strictly according to The Barrett Specification will last much longer than twenty years without repairs of any kind, and our new plan of issuing the 20-Year Surety Bond Guaranty gives owners the benefit of that experience.

Here is our offer:

On all roofs of fifty squares or more, in all towns of 25,000 or more throughout the United States and Canada, and in smaller towns where our Inspection Service is available; we will give a 20-Year Surety Bond Guaranty, provided the roof be laid strictly according to The Barrett Specification of May 1, 1916, and by a roofer approved by us.

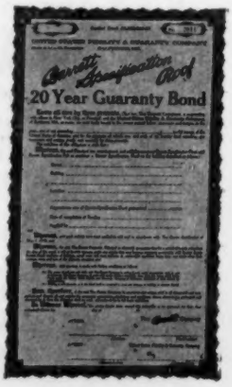
This bond exempts the owner from all expenses of maintenance and repairs for a period of twenty years.

We claim only the right to have an inspector on the roof during construction to insure strict compliance with the Specification.

The risk is ours, the gain is yours.

Leading architects, engineers and roofing contractors throughout the country are familiar with and indorse our plan.

A line to our nearest office will bring any information you may desire concerning this proposition.



A copy of The Barrett 20-Year Specification, with roofing diagrams, sent free on request

The Barrett Company

New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati Pittsburgh Detroit Birmingham Kansas City Minneapolis Nashville Salt Lake City Seattle Peoria

The Paterson Manufacturing Company, Limited: Montreal Toronto Winnipeg Vancouver St. John, N. B. Halifax, N. S. Sydney, N. S.

Notes About Men You Know.

W. H. M. WOODS.

W. H. M. WOODS, superintendent of the Moultrie (Ga.) Cotton Mills, for the past thirteen years and still busy at the job, originally came from Manchester, England, where his father was manager of a cotton manufacturing plant and where he began his mill career. After three years in Canada, he came to the United States and worked for a short time in the Utica (N. Y.) Steam Cotton Mill, later removing to Westerly, R. I., and then to Lonsdale, R. I., where he remained three years, during which time he aided in the starting of the then new Ann and Hope Mill of that company. Appreciating the opportunities then beginning to open in the South, Mr. Woods went to Louisville, Ky., where as overseer of carding he assisted in starting the Louisville Cotton Mills. From Louisville he went to the old Wilmington (N. C.) Cotton Mills and then to the Maginnis Cotton Mills at New Orleans. He was superintendent of the Natchez (Miss.) Cotton Mills for three years; held a similar position with the Norris Cotton Mills at Cateechee, S. C., for three years; and was superintendent, secretary and treasurer of the Alpha Mill, now the Fidelity Mfg. Co., at Charlotte, N. C., for about five years. However, he is the same jolly chap you all know. Don't take my word for it, look at his picture!

D. GILFILLAN, the well known representative of the H. & B. American Machine Company, died suddenly on the afternoon of August 8th while riding in his automobile on one of the principal streets of Atlanta. This was due to an apoplectic stroke, undoubtedly caused by the severe exertion of replacing a punctured tire. Mrs. Gilfillan was with him at the time. Mr. Gilfillan was a native of Scotland, although he has been an Atlanta resident for many years.

THOMAS T. B. WILLIAMS has resigned the position of superintendent of the Hawthorne Spinning Mills at Clover, S. C., and accepted a position as general manager of the Dilling Mills at Kings Mountain, N. C. Mr. Williams took charge on September 1st.

ELLIS T. GURRY, who is well known in the New England territory, having occupied several positions as overseer of carding with well known New England mills in Fitchburg, Mass., and Providence and Pawtuckett, R. I., has been called for duty as a private in Battery A. Rhode Island Field Artillery. The battery to which Mr. Gurry is attached was located at Quonsett Point, R. I., for a brief period and later removed to Boxford, Mass.

JOSEPH S. THOMAS, one of the oldest of the South Carolina mill superintendents, died recently at his home at Greenville, S. C. Mr. Thomas was formerly superintendent of the Monarch Mill in Union, S. C. Later he was made superintendent of the Fairmont Mill near Spartanburg, and was superintendent of the Pacolet Mills at Trough, S. C., for a period of eight years.

J. W. HUGHES of Cooleemee Cotton Mills, has resigned to accept a position with the Elmira Mill at Burlington, N. C., as overseer of weaving.

FRANK WILLIAMSON, who has been handling the Economy Fuse in the New England territory for the Economy Fuse and Manufacturing Co., of Chicago, has been transferred to South Coralina and will make headquarters in Columbia. It speaks well for the Carolina mill district that the business of the Economy Fuse Company has grown so greatly as to require a separate salesman to handle the South Carolina territory as a separate proposition.

E. W. CALLAHAN has resigned his position as superintendent of the Harmony Mills at Cohoes, N. Y., and accepted a similar position with the Fairhaven Mills, at New Bedford, Mass. This change was effective July 1st.

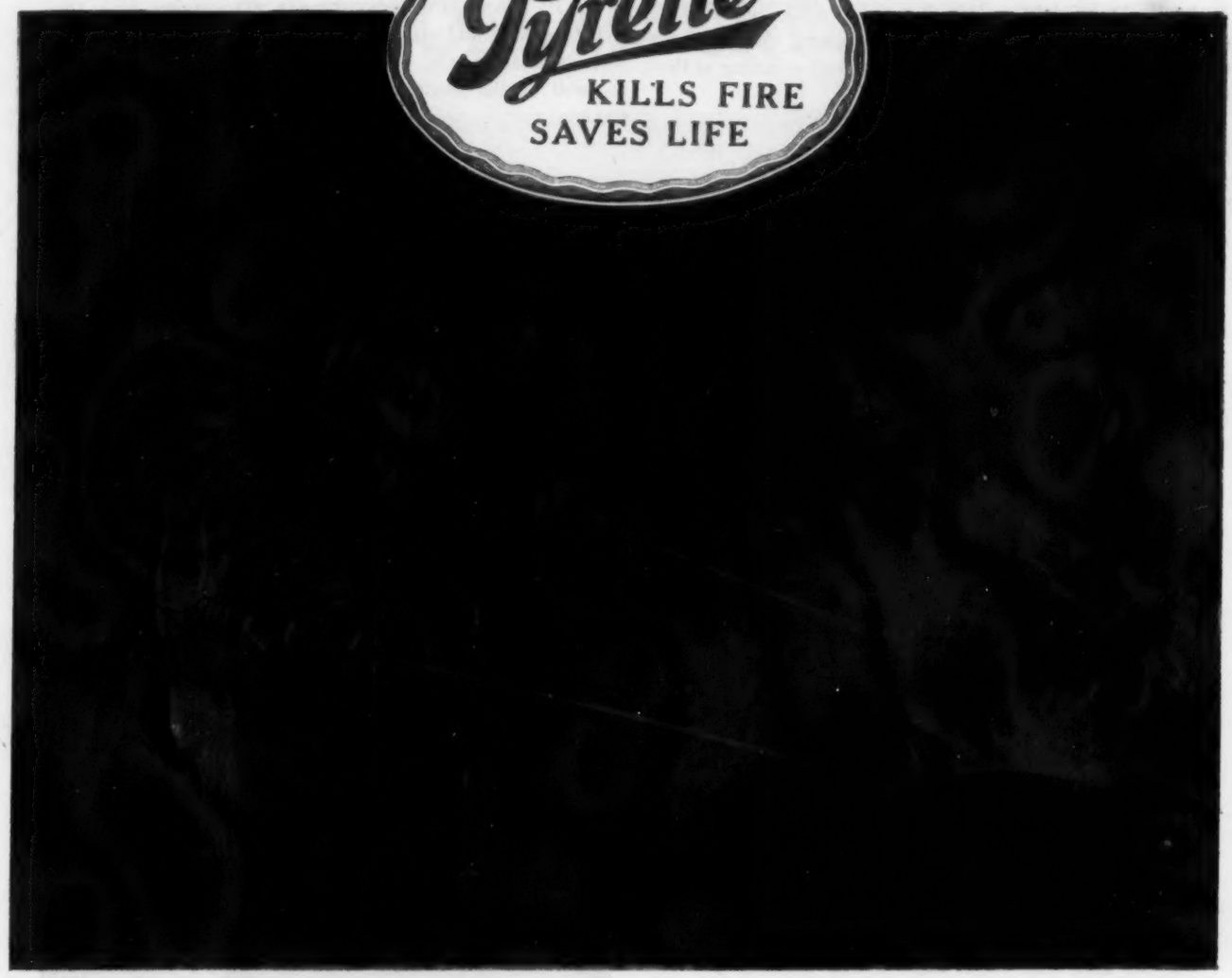
H. CHESTER GREENLAW, for the past four years superintendent of the B. B. & R. Knight Royal and Valley Queen Mills at Riverpoint, R. I., has been appointed agent of the Grosvenordale Mills, at Grosvenordale, Conn. He assumed charge there on July 30th. Prior to becoming superintendent of the Royal and Valley Queen Mills, Mr. Greenlaw was superintendent of the Nottingham Mills at Providence, R. I., for five years. He has made such an enviable reputation for himself in the past that his friends look forward with interest to the results he will undoubtedly achieve in his new position.

GUY H. NORTHCUTT, formerly superintendent of the Marietta (Ga.) Knitting Company, who resigned to go into training at the officers' training camp at Fort McPherson Ga., has been commissioned Second Lieutenant.

M. J. HAWKINS has resigned his position as overseer of carding and spinning for the Corriher Mills Co., at Landis.

Pyrene

KILLS FIRE
SAVES LIFE



THIS FIRE LASTED JUST TWO AND ONE HALF MINUTES

There was no panic; no wild stampede to a fire escape or stairway. There were no shrieks or groans. No wives or mothers waiting, pale with horror, while charred bodies were carried from the ruins.

This employer was ready for fire. Ready with Pyrene. Pyrene on pillars. Pyrene against walls. Pyrene at stairway landings. Pyrene in elevators. Pyrene in the dynamo room. Pyrene in the offices.

When fire came several men grabbed Pyrenes. The concentrated extinguishing liquid smothered the fire in no time. Pyrene kills fire—quick.

Any manufacturer who hasn't his factory equipped with Pyrene, plays a monstrous game of chance.

$10.00, bracket included.

Pyrene Manufacturing Company, New York City.

Every Appliance for Fire Protection

N. C., and accepted a position as night superintendent of the A. A. Shuford Mills of Hickory, N. C. On leaving his position in Landis the operatives of his department presented him with a very handsome masonic ring.

P. K. DRY, night carder and spinner for the Tuckaseege Mfg. Co., Mt. Holly, N. C., is resigning that position to take a position as overseer of carding and spinning at the Corriher Mills at Landis, N. C.

W. S. TAYLOR, of the Arlington Mills, Lawrence, Mass., has accepted the position of superintendent of the Brookford Mills, Hickory, N. C.

S. W. MIMMS, superintendent of the Capital City Mills and the Richland Cotton Mills, Columbia, S. C., has also become superintendent of the Granby Cotton Mills and the Olympia Mills and thereby superintendent of all the mills of the Hampton Cotton Mills, Columbia, S. C., under W. P. Hamrick as general superintendent.

J. W. PARKER, Secretary and Treasurer of the Pelham (Ga.) Mfg. Co., and one of the "Live Wires" in the Southern manufacturing field.

WILLIAM BAUER has accepted a position as night superintendent of the Goodyear Cotton Mills, Killingly, Conn. He comes from Providence, R. I.

R. E. HENRY has resigned as general superintendent of the Victor-Monaghan Mills Co., to become manager of the Utica Cotton Company, at Utica, N. Y.

T. M. MCNEILL, superintendent of the Olympia and Granby plants of the Pacific Mills at Columbia, S. C., has resigned to accept a similar position with the Monarch Cotton Mills at Union, S. C.

A. H. COTTINGHAM, sperintendent of the Monarch Cotton Mills at Union, S. C., has resigned this position, having been appointed general manager of the Victor-Monaghan group of mills.

J. W. CONNELLY, who formerly had charge of the twisting and spooling for the Grant Yarn Company, Fitchburg, Mass., is now assistant superintendent with the Jenckes Spinning Company, Pawtucket, R. I.

W. P. Lee has resigned as overseer of spinning at the Climax Mills, Belmont, N. C., to become superintendent of the Pinkney Mills, Gastonia, S. C.

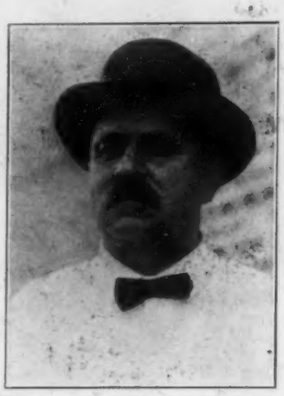
HENRY F. SISSON, for the past five years superintendent of the Centreville Mills, B. B. & R. Knight Mills, Centreville, R. I., has been transferred to the position as superintendent of the Royal and Valley Queen Mills, Riverpoint R. I.

D. E. KENNEDY, overseer of carding and spinning at the Dilling Mills, Kings Mountain, N. C., will hereafter be assistant superintendent also.

J. R. YOUNG has resigned as overseer of spinning at the Loray Mills, Gastonia, N. C., to become superintendent of the Phoenix Mills, Kings Mountain, N. C.

JOHN W. H. BUCKLEY has been appointed night superintendent for the Bibb Manufacturing Co., Columbus, Ga.

S. P. BLAND, formerly overseer of weaving with the Erlanger Mills at Lexington, N. C., has accepted a position with the Stafford Co., of Readville, Mass., and is located at the mill of the Montreal Cotton Co., Valleyfield, Quebec, Canada.



W. J. MCDONALD, superintendent of the Pelham (Ga.) Mfg. Co. A man who has read COTTON ever since it absorbed the Boston Journal of Commerce.

E. N. TART has been promoted from overseer of carding at the Brookford Mills, Hickory, N. C., to superintendent of the new Hickory Spinning Mills, of the same place.

JOHN A. MCFALLS has resigned as superintendent of the Dilling Mills, Kings Mountain, N. C., to become superintendent of the Elizabeth Mills, Charlotte, N. C.

D. C. WILLIAMS, who recently resigned as superintendent of the Elizabeth Mills, in Charlotte, N. C., to become superintendent of the Mutual Mills, Gastonia, N. C., has purchased an interest in the Indian Creek Mills, Lincolnton, N. C., and will become manager and superintendent of that mill.

TWO POPULAR OVERSEERS.

Left to right: R. L. Smith, overseer of carding and spinning at the Moultrie (Ga.) Cotton Mills, and S. J. Holmes overseer of weaving who has recently come to the Moultrie Cotton Mills from the Laurel (Miss.) Cotton Mills.

W. H. GIBSON, JR., superintendent of the Union Mills, Union, S. C., is also acting as superintendent of the Santee Mills, Orangeburg, S. C.

J. M. JORDAN, day overseer of carding and spinning at the Adelaide Mills, Anniston, Ala., is now acting as night superintendent also.

J. F. REARDON, lately of the Grosvenor Dale Co., Grosvenordale, Conn., has become superintendent of the Fall

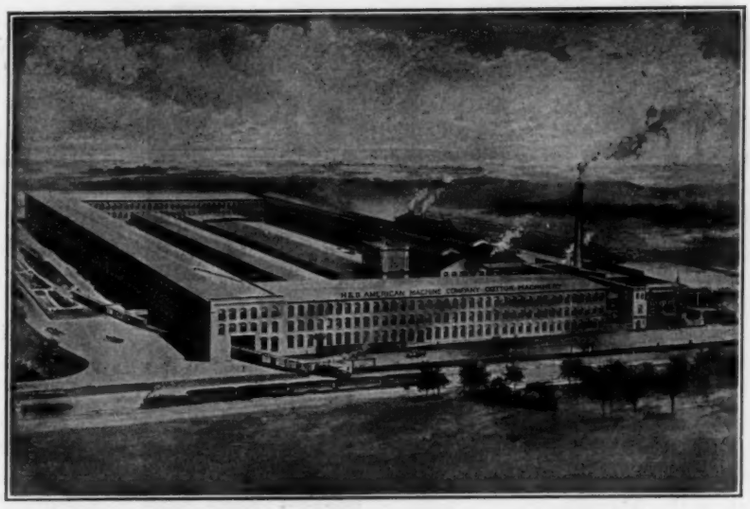
C. E. RILEY, Pres.
Boston Office
161 Devonshire Street

Southern Offices
814-815 Empire Bldg.
Atlanta, Ga.

COTTON MACHINERY

Opening and Picking Machinery

Card Room Machinery



Spinning Room Machinery

Twisters for Wet or Dry Work

With Band or Tape Drive

H. & B. AMERICAN MACHINE COMPANY

PAWTUCKET, R. I.

River Iron Works Co.'s extensive plant in Fall River, Mass.

PROSEY D. OWEN has been promoted to general overseer of spinning, on both day and night shift, at the Huntsville (Ala.) Cotton Mills.

J. H. HADDOCK has been transferred from the office of the Stonewall Cotton Mills, Stonewall, Miss., to superintendent of that mill.

GEORGE TOBY, who has been overseer of carding for the Newmarket Manufacturing Company, Newmarket, N. H., has been made superintendent of the cotton department at the same mill.

HARTLEY G. KLINE, formerly connected with the Acorn Knitting Mills, Reading, Pa., has been made superintendent of the Penn Hosiery Co., Reading, Pa.

B. P. CREECH has resigned as overseer of spinning No 2 at the Fulton Bag and Cotton Mills, Atlanta, Ga., and accepted a similar position at the Thatcher Spinning Mills Chattanooga, Tenn.

W. E. TISDALE has resigned as assistant superintendent of the Hart Mills No. 2, Tarboro, N. C., to become overseer of carding and spinning at the Mecklenburg Mills, Charlotte, N. C.

OMAR LINDER has resigned his position at the Louisville (Ky.) Cotton Mills, to become overseer of carding and combing at the new cotton mills at the Ten Broeck Tire Co., of the same place.

HOMER SMITH, formerly overseer of carding at the Manchester (Ga.) Mills now has a similar position at the Villa Rica (Ga.) Mills.

JAMES MOORE has accepted the position of spinner at the Kincaid Mills, No. 1, Griffin, Ga.

E. B. BYRD has resigned as night carder and spinner at the Cook Duck Mills, Cedartown, Ga., to become day carder in the cotton department of the Atlanta Woolen Mills, Atlanta, Ga.

O. H. BENTON has accepted the position of overseer of carding and spinning at the Glenola Mills, Eufaula, Ala.

GEORGE PARKER has accepted the position of overseer of spinning at the Hamburger Cotton Mills, Columbus, Ga.

J. L. HOOVER has been transferred from night superintendent of the Elizabeth Mills, Charlotte, N. C., to overseer of spinning on both day and night run.

JAMES R. FIELD has become overseer of carding at the Union Mills, LaFayette, Ga.

W. M. MORRIS, formerly overseer of spinning Fulton Bag & Cotton Mills, Atlanta, Ga., has accepted position as overseer of carding and spinning, Saluda Mfg. Co., Greenville, S. C.

R. S. MITCHIN, of McComb City, Miss., has accepted the position of overseer of carding at the Brookford Mills, Hickory, N. C.

R. S. THOMPSON has resigned as overseer of spinning, twisting and warping at the Stonewall (Miss.) Mills and accepted a similar position at the Eatonton (Ga.) Mills.

J. F. WRIGHT has resigned as overseer of carding at the Laurel Hill (N. C.) Mills, and accepted a similar position at the Hamer Mills, Dillon, S. C.

L. D. ARTHUR has been promoted from second hand to night overseer of spinning and spooling at the Apalache Mills, Arlington, S. C.

W. T. MOORE, of Corsicana, Tex., has become overseer

of carding and spining at night at the Gonzales (Tex.) Mills.

ALBERT J. OWLER, superintendent of the Eagleville Company, Eagleville, Conn., resigned on September 1st, to accept a similar position with the Arctic Mills of the B. B. & R. Knight Co., at Riverpoint, R. I. Mr. Tifft, overseer of carding at the Valley Queen Mills of the B. B. & R. Knight Co., at Riverpoint, succeeds Mr. Owler as superintendent at Eagleville, Conn.

LUTHER CALHOUN has accepted the position of night overseer of spinning at the Gate City Cotton Mills, Atlanta, Ga.

H. H. ELLIS has resigned his position at the Brandon Mills, Greenville, S. C., to become overseer of the cloth room at the Bamberg (S. C.) Mills.

EDWARD BARNES has resigned as overseer of spinning at Williamston, S. C., to become overseer of carding and spinning at the Echota Mills, Calhoun, Ga.

T. A. DRAKE has resigned as overseer of spinning at the Echota Mills, Calhoun, Ga., and accepted a similar position at the Tarboro (N. C.) Cotton Factory.

P. S. CRAWFORD of Alexander City, Ala., has accepted position as carder and spinner at the Sally B. Mills, Sylacauga, Ala.

E. B. HAMBY, of Tallassee, Ala., has accepted the position of overseer of weaving at the Abbeville (S. C.) Mills.

ARTHUR J. RICHARDS, 60, superintendent of No. 2 and 3 mills of the American Thread Company, died recently at the City Hospital, Holyoke, Mass., where he was operated upon for intestinal trouble. Mr. Richards had been ill at his home for the past three months. He had been employed as superintendent of the Merrick Mills since March 1st, 1909. Previous to his coming to Holyoke he held the position of assistant superintendent of the American Thread Mills at Willimantic, Conn., for a period of ten years. He was a living contradiction of the sometimes accepted belief that a mill manager had to be only a dividend producing machine. He had the broader outlook that marks the most successful mill managers. He held to the belief that his concern would be more honored in the city at large and the employees of the concern far happier if they worked with their surroundings made as cheerful as they could be. To that end he lost no time in tearing down the unsightly fences and walls about the mill properties and made beautiful things grow where all was waste and ugliness before. The example he set was followed by others and today manufacturing Holyoke is far less unattractive than it was ten years ago. The world is a bit better because Mr. Richards lived and no man could ask a better sermon than that.

Mr. Richards was also somewhat of inventor, and introduced many new ideas, amongst them being the Richards Hinds Rolls for spinning frames. This invention was considered one of the greater cotton mill improvements and the rolls are now used extensively throughout the country. He was a member of the Williamantic lodge, of Knights Templars and Eastern Star lodge, No. 44. He was born in Danvers, Mass., July 7th, 1857, and was the son of Arthur J. Richards and Mary Ann Dean.

And another of life's mysteries is the man who champions the policy of doing business without an accurate cost-keeping system.

The Keating-Owen Bill Regulations.

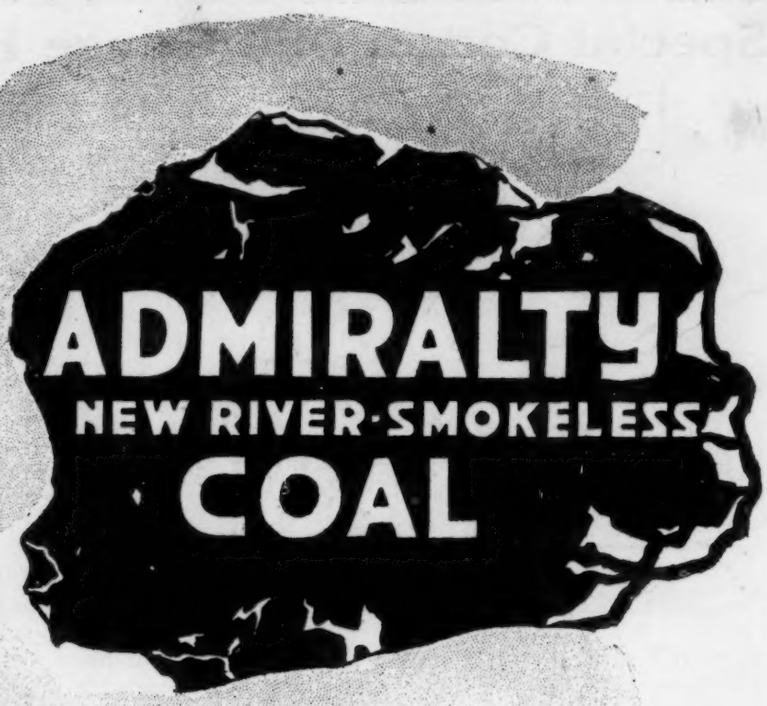
Cotton manufacturers all over the country are today preparing to comply with all the provisions of the Keating-Owen Bill, which is another name for the National Child Labor Law recently enacted by Congress. This law took effect on September 1st, and arrangements of a more or less temporary nature were made by every textile mill to keep employees time and meet the conditions specified in the law. However, these newly devised conditions and tentative arrangements must, sooner or later, give way to something of a permanent character that will not only satisfy the inspectors of the Department of Labor, but that will also prove simple, economical and efficient in the mills employing part time workers.

Such a device is manufactured by the Howard Time Recorder Co., 373 Washington Street, Boston, Mass. The absence of complications in the recording mechanism of these clocks or recorders, is a guarantee of their durability. This recorder provides distinctive "in" and "out" marks, for the accuracy of which a mechanical device is provided which must be pushed to its proper position at either in or out before registration on the part of the operative is possible.

This recorder provides a perfect time keeping clock movement which is wound each week, and a simple mechanism to raise and lower the record sheet automatically. These record sheets come punched ready for hanging in place, printed in two colors, black and light yellow; each hour is distinct, being marked by heavy cross ruling with figures at each end, and sub-divided into ten minute spaces. The wide yellow stripes do not interfere with the legibility of registration, but are a great help when computing time, serving as a guide to the eye when glancing across the page. Spaces for totals in hours and minutes are provided at the foot of each column. This eliminates transferring, and makes a complete record, which is easily preserved for reference.

In appearance, these recorders being of dark stained oak, with a high finish, and with all exposed metal parts oxidized and laquered, provide a mechanism that is not only useful, but decorative. A number of plants in many sections of the country have been employing these clocks for an extended period in the checking of the time worked by the operatives. The illustration shows the general appearance of these recorders.

The General Electric Company has just issued Bulletin No. 43503 on "The Application of Novalux Units to Ornamental Street Lighting." The bulletin is attractively prepared, containing 36 pages fully illustrating the correct lighting units for business streets, residential streets and outlying districts.



MAKE THREE TESTS

One for heat unit efficiency, one for free burning characteristics and one for smokeless qualities. Use the best grades of Welsh Coals in a comparative test with ADMIRALTY. You will reach this conclusion:—

ADMIRALTY is the equal of the highest quality Welsh Coal in heat developed at combustion and in physical make-up. It does not clinker, but as it is burned the ash drops from the coal, leaving a fresh surface of live coals exposed.

WRITE FOR INTERESTING LITERATURE

Analysis made by the United States Government of twenty-five consignments of ADMIRALTY for barges and steamers at Hampton Roads, approximating 43,000 tons, resulted as follows:

Moisture 2.6	Vol. Matter 18.9	Fixed Carbon 76.5
Ash 4.5	Sulphur .88	B. T. U. 14,921

The Chesapeake & Ohio Coal and Coke Company

(Selling Agents for New River Collieries Co.)

EXECUTIVE OFFICE, 120 Broadway, New York City

WESTERN OFFICE
First Natl. Bank Bldg.
Cincinnati, Ohio

SHIPPING OFFICES
Sun, W. Va.
Eccles, W. Va

TIDEWATER AND EASTERN OFFICE
Board of Trade Bldg.,
Norfolk, Va.

FOREIGN AGENTS

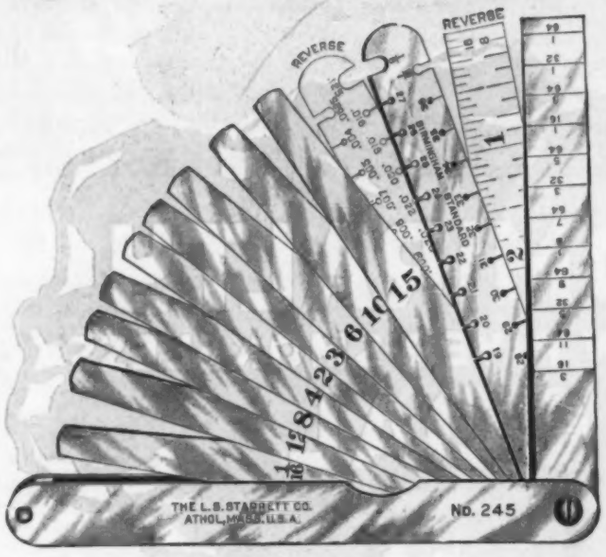
W. H. Newman
Trafalgar Bldgs.,
Northum erland Ave.,
London, S. W.

M. C. Piggott
4 Lloyds Ave.,
London, E. C.

SOUTH AMERICA
Chadwick, Weir & Co., Ltd.
25 De Mayo, 158
Buenos Ayres

NEW RIVER Collieries Company
ADMIRALTY
SMOKELESS
COAL

Special Cotton Mill Gauge Free—



for a few minutes of your time.

The taper gauge shows the thickness in 64ths to 1/16ths of an inch on one side, and on the reverse side is graduated as a rule three inches of its length, reading in 8ths and 16ths of an inch.

The wire gauge, English Standard, shows on one side sizes numbered from 19 to 36, with two extra slots, one 1/16, the other ⅛ on an inch, and on the other side shows the decimal equivalents expressed in thousandths. This gage has also 9 thickness or feeler gage leaves, approximately 4 inches long, of the following thicknesses: .002, .003, .004, .006, 008, 010, .012, .015 and 1/16th of an inch all folded within the case, which is 4¾ inches long, convenient to handle or to carry in the pocket.

Our Service Department desires the opinions of active mill men on the quality of the work shown in the advertising pages of this issue of COTTON.

We are, therefore, going to give this gauge for the best letter by a mill executive who gives the clearest and most definite reasons why, and in what maner, any certain advertisement is, in his opinion, the best.

Contestants must be mill executives, from overseers to presidents, connected with spinning, weaving, knitting, or finishing plants. The letter must be accompanied by the name, address and official position of the writer in order to be eligible, and must reach this office not later than the first of the month succeeding the date of issue.

The judges will be the Editor of COTTON and the Manager of the Service Department, whose decision will be final. The name of winning contestant will be announced in COTTON'S pages.

Address Contest Department of COTTON, Atlanta, Georgia.

Advertising Contest.

The writer of the winning letter in the July advertising contest was Robert W. Boys of Killingly, Conn. The letter follows:

The Winning Letter.

Killingly, Conn., July 26 1917.

EDITOR COTTON:

In entering your contest for set of gauges, I consider the advertisment on the first page of your July issue advertising Pyrene the best and most self explanatory in the issue. In the first place the advertisement shows an illustration of a fire that all mill men dread, and the cause of the fire is very clearly mentioned. All mill men know that quick action is certainly necessary in a cotton mill fire and there is no question about the effectiveness of Pyrene for immediate use. I should consider that this advertisement would appeal to all mill men who are subscribers for COTTON.

Yours very truly,
Robert W. Boys, General Supt.,
Goodyear Cotton Mills, Inc.

Killingly, Conn., August 11, 1917.

EDITOR COTTON:

It was with a great deal of pleasure I received your letter of August 6th advising me that I was the winner in the advertising contest.

I will make it my business to take part in the discussions of "How Other Men Manage." I will try to do this when I receive my August number of COTTON.

Wishing your textile magazine the greatest success, I am,

Very truly yours
R. W. Boys, Superintendent,
Goodyear Cotton Mills, Inc.

On July 9th the Sizol plant of the Saydel Mfg. Co., was destroyed by fire. Just ten days later, on July 20th, the Seydel Mfg. Co., announced to its customers and friends they were in operation and producing sizol and that the needs of all customers would be carefully looked after. This wonderful performance is well in line with the previous reputation of this company for progressiveness and hustle.

A Question on Combers.

EDITOR COTTON:

If we "heavy up" on the breaker drawing and doublers, would it make the laps so heavy that the combers would run badly? If so, what timings or settings should be changed to overcome this difficulty and still get the same weight per yard off the combers?

In a recent experience of this character making the drawing and doubling heavier seemed to make the ends break in the pan back of the table calender rolls. I shall be glad to hear from COTTON'S experienced correspondents on these questions. Darhol (Conn.)

How Other Men Manage

Practical Discussions by Cotton's Readers on all varieties of Mill Subjects

A Question for Carders.

EDITOR COTTON:

Recently I began re-covering the licker-ins on my revolving flat cards, and almost instantly I began finding the licker-in mote knife brackets were being broken. It occurs on one side of the card almost exclusively. Standing behind the card, and looking towards the front its the left-hand knife, although sometimes I find both broken.

I am using a 12-ounce lap, and am setting the first knife to a 12/1000 gauge, the second knife to a 10/1000 gauge, this is the same setting that I have used heretofore and never had any trouble with broken knives, and am setting them to the same angle to which I had been accustomed. Also I have the same finisher man to weigh the laps in the picker room that I have had for some time and am sure he is wrapping them around the slip-pin smoothly and evenly.

I do not want to change my settings, or the angle of my knives, as I experimented a long time to find the best settings for taking out the most trash and short fibers, and found the settings that I now have to give me the best results.

Would appreciate a few lines from "Wash (Mass)," and other carder readers upon this question?

T. A. D. (Ga.)

Overcoming Mill Problems.

EDITOR COTTON:

In these days of labor shortage and the independent spirit shown by certain classes, I would like to see articles in your paper from various mill officials to learn what they are doing to overcome the problems that arise. Here is one instance in which officials can do a great deal to help one another and also the country by helping others to increase their productions. Problems will be different in different localities and even in the same locality, and I for one would be glad to hear of any problem that has been solved, even if I cannot use it now, I might later.

For illustration I will give a problem that came up in my room which I had to solve. We run coarse and fine work, which requires quite a number of coarse frames. The job always called for two roving boys. One for most of the coarse frames and the other to take care of the jacks and the rest of the coarse frames. Neither boy was overworked yet the job was too much for one boy. As summer advanced boys became scarce and hard to get. Yet they are absolutely needed for some of the jobs. To relieve one of the roving boys was my problem.

I got the best of the two and told him I wanted him to double up and take care of all the coarse frames and that I would pay him more for doing it. That left me with just the jacks to deal with. Then I took one of of the doffers (a tall girl) and asked her to take the job of "roving boy." I was able to pay her a little more than she was getting as doffer and yet keep the total within my pay limit. The rest of the help entered into the spirit of the change and helped both at first and now I have two first-class roving boys.

As male labor continued to be short I took in all the strong girls I could get hold of and put them on drawings and doublers. I have worked out a plan for helping out on the cards if I run short after the draft.

My cards are arranged in rows facing each other. One boy looking after each row. My plan is to put a strong girl to run the fronts and have a boy to run the backs. I have two boys to do the stripping. In this way I will do away with half of the boys on the cards. Of course I will have to adjust the pays somewhat, perhaps give the boy 9/8 of the pay of two boys and the girl 7/8. I have not tried this plan out yet but I think it will work.

So far I have dealt with the problems of keeping the machinery running, yet there is the serious problem of keeping the help and cutting down the loss to a minimum.

One overseer I know of is afraid to go through his room for fear of what he may find there. He fears that he will see things that are wrong and go up in the air and thereby lose another hand. Another overseer keeps out of sight as much as possible as be thinks that if the help see him they may find some grievance to complain about and while he is out of sight he is holding the help. The way I look at this is, if the help have a real grievance they will find the overseer and get it over with, while the others may not have a real grievance yet it is better to meet them and reason or show them that they haven't any cause to complain at all. I have found most help reasonable to a certain extent if I talk right to them.

I also believe it is up to the overseer to go through his room and keep everything up to the standard as near as possible. Not to say, when the man higher up wants to know about this or that, why I've seen that but I am pretty short now and I don't dare say anything for fear of losing more help." If you were the man higher up would you let him get away with that? If you have successfully got over this why not write and tell the man who is in the rut the way to get out and stay out. Tell him that the help are human and can be talked to. Tell him that his greatest asset is to control his temper. Tell him not to be sarcastic because the operatives haven't got to stand for it. Tell him not to drive, but to be gentle, lead them on. Tell him that it *is* the help that runs the room, he only guides the work and keeps things straight and if he don't believe it—take the help out and then where is he?

I have seen overseers fall for all of these causes and I think it is up to us to help them (if they will be helped),

and point out how they can increase production and hold help while our country needs the production.. Are you doing your bit? White to COTTON today.

Carder (Mass.)

A Practical Discussion.

EDITOR COTTON:

It is a common method with writers on cotton mixing, and causes of uneven yarn, to say, "mix enough cotton at one time to run the mill for two or three days." Now let us reason on this thing awhile! The man who runs the mill is very seldom one of the promoters, or organizers, or has to do with making the plans for the mill, hence, the floor space in the mixing room is left entirely with the organizers, and how many of these rooms are provided with such floor space?

I admit, of course, that this is a good policy, but what of the poor fellow who reads these articles who has not such space at his disposal and is at the same time having trouble with uneven yarn, What is he to do?

In my opinion it is not altogether necessary that this should be done unless there is a reimbursement in the prices of the product. If the same price is secured for yarns in which the bales of cotton are mixed from one another into the feeders direct that is received on yarns mixed two or three days in advance of the working, "what's the use." Its just that much cost and no returns. Competition of mill products on the markets has become so severe that mills have to cut every expense that they can.

Cotton well graded, and mixing, say ten bales at a time, a little off of each bale, will give a mighty even mixing, the difference between this plan and the method of mixing it for two or three days will not pay the difference in cost in greater returns to the mill.

Where it is possible, cotton should be fed to the hoppers by a cotton conveyor from the opener hoppers through suction pipes, this gives the best average mixing that can be secured. It will produce the same weight in the hoppers at all times, hence, the same, or practically the same weight of lap on the fronts at all times, and this is a good start to make towards an even lap.

Some writers recommend that machines should have "sprocket" chains on the aprons to insure "no" slipping. Let us analyze this statement a bit. To start with, the chain is on the driver shaft of the lap apron; the lap apron is driven from the cone by a belt, thence to a calander belt from the beater shaft, thence by a belt to the over-head counter shaft; now to insure that no slipping should occur, all transmission should be on sprockets, as if they are not, there are chances of slipping. The sprocket chains are placed on the driver shaft thence to the remaining cross shafts on the aprons (which are three intermediate shafts and one tail-end shaft, around which the apron goes). This first shaft (the driver) is driven through a train of gears, and the driving cone. The cone on this driver shaft is driven by a belt. There are four fluted pulleys, about four inches in diameter, that the apron runs on, and with which the sprockets are connected. This apron is not now sprocketed to match with the sprockets on the shaft, so it's mere friction after all, with the cotton to weight the apron so that it will not slip.

If the over-head drive is of chain type, and the calender belt is of chain type, and the evener belt also is of the chain type (on sprockets) and the apron on chains, then it might be said that there was no slipping, but even then the apron would have to be "made on chains," to connect with the sprocket-pulleys to be a non-slip apron. Not all machines that use the sprocket chains on the apron have more than two places that they have sprockets, and that is on the front or driving, and the back shafts; so the aprons may slip on the shafts, and still the shafts will keep on turning.

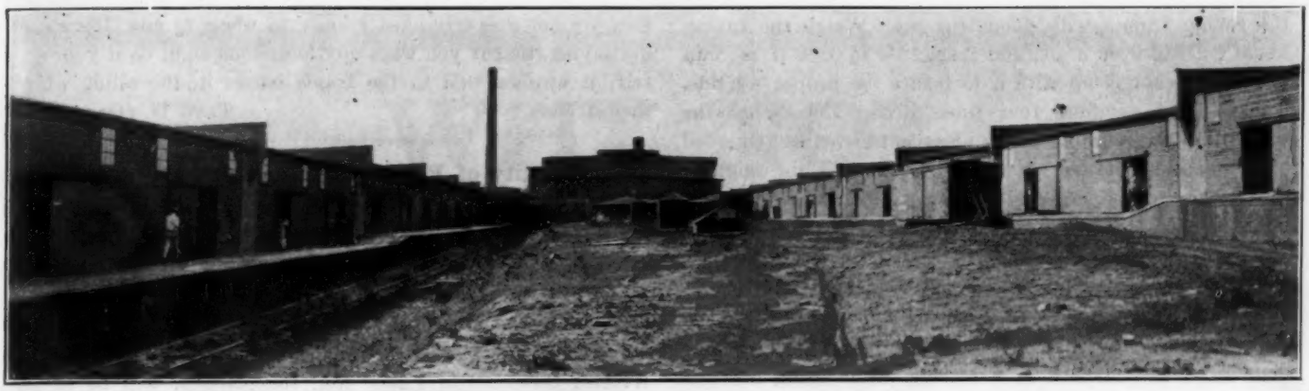
The object of writing this letter is to curtail this loose way of writing on technical subjects and get down to the practical conditions found in every-day mill life. Everything that looks good on paper does not work good in the mill when put into practice, although such articles frequently furnish some other idea at the time you are reading them that will work. Then again, what will work for one man may not work for another, owing to the different conditions, and the different makes of machinery.

Writers also condemn the use of untrained help on the drawing frames, claiming that they will make inferior work. How, then, are we to get the help to run the drawing frames? It's like teaching a child not to go in the water until he learns to swim. They have to learn on anything they may go at in the mill by actually going through the motions that it requires to operate the different machines. They have to be instructed in the importance of doing it certain ways, and in not doing it some other ways. I find it the best policy to tell them to carefully watch the one who is teaching them, before undertaking to operate a machine themselves, even if they stand idle for a half day before trying to even start the machine when an end breaks back.

Although untrained help will make a certain amount of bad work anywhere, all any one can do is to reduce the chances of bad work all he can by impressing on the learners the effect mistakes have on the yarn.

I find that women are the best to work on the drawing frames. Some two or three years ago the boys became very scarce in the spinning department and I shifted what I had to the spinning room as fast as I could get women to fill their places. Immediately I began to see that drawing slivers were better, and the work more even. A woman will ordinarily do what is right without as close watching or they will not stay on the job; while boys will not work anywhere without close watching, but will still hang onto the job.

Some writers advise weighing the drawing sliver at least four times a day, and change gears when it is either heavy or light. They don't say who is to do this weighing of the sliver, nor what other duties will be given the weigher. If the overseer gives it personal attention it will take him away from a lot of other duties that also need his attention; and it will be the same with the second-hand. There are a lot of things that can be done and kept up with by taking short-cuts, and this weighing, or sizing as we call it in the mill, can be taken care of in the same way by having the laps weighed correctly, and by having the cards set good and true and lapped as they should be, the drawing frames kept clean, oiled, and properly weighted on the top rolls (the weights sometimes get mixed) the tension good and the trumpets of the same size bore; and good clean rolls on



View of Two of the Three Freight Platforms

C. V. TRUITT, Pres.
S. Y. AUSTIN, V. P. & G. M.

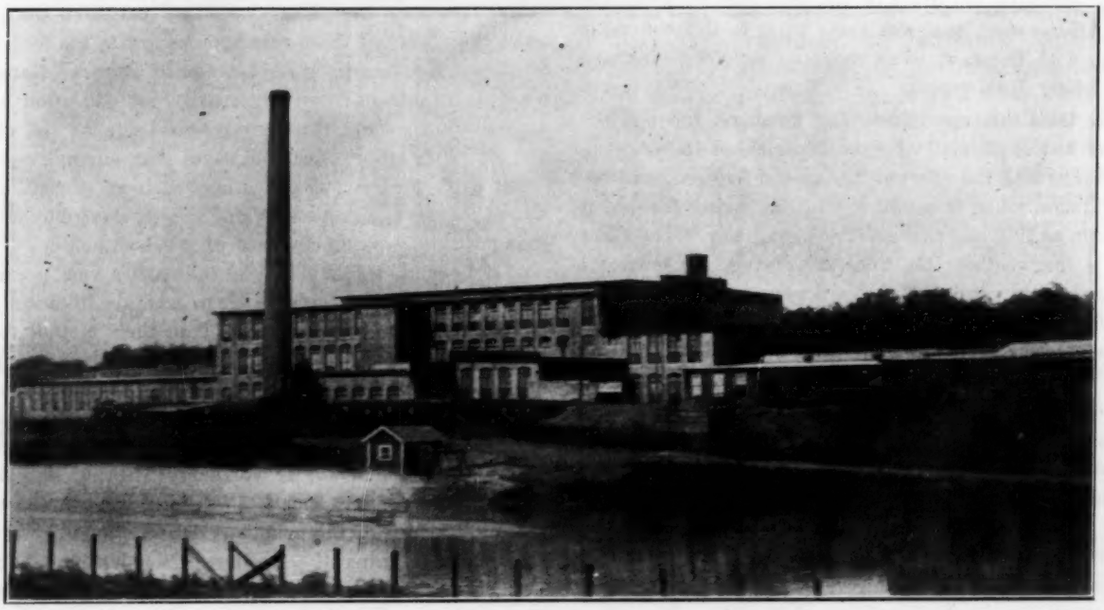
FULLER E. CALLAWAY, Treas.
J. A. PERRY, Secretary.

VALLEY WASTE MILLS

Hillside Cotton Mills, Owners

LAGRANGE, GA.

Cason J. Callaway, Mgr.



WE PURCHASE every grade of waste that is produced in a cotton mill. Before contracting for your 1918 production, be sure to give us an opportunity to figure with you. Transportation difficulties are growing greater daily, but no embargoes are likely to be placed on lines coming into LaGrange.

the roving frames with good tensions. Weigh the roving about 8:30 to 9:00 a. m., and from 2:30 to 3:30 p. m., and keep close enough up with it to insure the proper weights. I have tried weighing four times a day and change the roving frame according to my ideas as to whether it needed it or not, and I did not get as good results as I did weighing twice a day; it seemed to be doing too much. Then when a change was needed, I would use crown gears instead of draft gears; these gears run from 99 to 101 teeth and are driven gears, the draft gears are drivers and run from 30 to 40 teeth, some less teeth and some more.

The draft gear change, when changing a 30 tooth gear will make one-thirtieth of a change, while using a crown gear it will make only one one-hundredth of a change, in other words, if the roving was weighing 50-grains and you change one tooth in the draft gear it would result in changing the weights 1.2/3-grains per 12 yards, whereas, if you use, say the 99-crown gear it would be $99 \times 50 \div 100 =$ 49.50-grains, or 50/100 grains against the draft gear change of 1 2/3 grains per 12 yards.

This same effect will be felt if you make a change on the drawing frames and it will be harder on you in keeping the weights at the roving frames, for you have no crown changing there. I have never heard of any, at least, and when an overseer gets to using the crown gear change on the roving frames he does not want to go that far back. Also think how this 1 2/3-grain change will affect the tension on the roving frames! You can keep up with the weather very well and change the tensions, for it effects all frames the same, but changing the draft on the drawings works differently. All the stock that was made prior to this change is mixed up with the new, some weighing say 50-grains and some weighing 51.66-grains.

I have tried this way of keeping numbers, and find the best is as just explained. I have experienced the drawing frame change and the effect it has on the tensions, and besides, at times, when it would get to the roving frames, it would seem as if I had changed the wrong way. The cause of this is the weather; the finer the roving, the longer it takes the stock to get out of the card room. Make a change today when it has been dry for several days and the drawing sliver has become light from the want of humidity; put on this 1.2/3-grain change, and perhaps tomorrow it may set in raining. Of course this is going to add to the weight. Then the draft gear change on top of this is going to show up. Take it day after day, give the same weight laps and no changing on the drawing frames and change the crown gear on the roving frames, and the warper beams will not vary more than 10 per cent from the standard.

Some writers advocate oiling the spindles on the roving frames every morning. Try this, and then try oiling them three times a week, then try twice a week, and then once a week and see the difference in the running of the frames. The more oil used on the spindles the harder the frames will run, also they choke up with lint around the spindles and it works up into the bolsters..

Others say to oil the spindle steps every two weeks. I find that all the roving frames I ever worked on, there was room enough in the steps to hold oil for at least four weeks. My rule for oiling steps is the first Saturday morning in every month, just before shutting down, for the week end; and each frame hand oils the steps on that frame, then if they are not properly oiled I know to whom to go. It's an old saying, that if you want anything done right do it yourself, it applies well to the frame hands in the oiling of their frames.

T. A. D. (Ga.)

Responsibility of Parents and Guardians Under the New Child Labor Law.

"The Fulton," house organ of the Fulton Bag & Cotton Mills, Atlanta, Ga., in a leading article contained in its current issue, under the caption "The Opening of School," exhorts its employees to a compliance with the "spirit" of the Keating-Owen Child Labor Act, conceding it will be enforced to the letter, so far as the employer is concerned.

While the articie referred to is addressed primarily to parents and guardians employed in those mills, its substance is worthy of note as suggesting the attitude of the mills' management toward a law upon the statute books to which it is bound to obey. That aspect of the article COTTON believes is typical of the sentiment of most cotton mill managements throughout the South, and we reproduce it here in its entirety:

THE OPENING OF SCHOOL.

"Beginning with the calendar month in which this issue is dated, we are intuitively reminded of the early approach of school openings for the first of the 1917-18 scholastic sessions.

"If there can be crowded into a single word all those elements almost indispensable to success in life, all those prime essentials that make for clear judgment and quick conception, and all those things necessary to the attainment of a maximum happiness, proportioned to one's means, that word is *education*. Not necessarily an education in the higher branches of learning—a knowledge of the classics and ability to speak other languages than our native tongue—but a common school education; such an education as is within the reach, at this day and age, of every boy and girl living within walking distance of a school-house.

"It is comparatively few of the earth's vast population who are educated in the classics, or who are linguists, capable of speaking other languages than their mother tongue; but of the great number attaining successes in life and who are assured lives of comfort and ease in their old age from incomes arising out of matured fortunes as a result of earlier business activities, it is the exception and not the rule where we find *one* so fortunate who has not at least the rudiments of an education. In other words, those without a knowledge of the primary essentials to an education—training in the three R's, as known in olden days—are at a decided disadvantage, to say the least, in competing for their successes with that greater number who are so trained. Such circumstance, indeed, would seem to make their cases almost hopeless.

"From the standpoint of the supreme importance of an education, therefore, let us consider what is involved when we neglect to send our children to school; and consider, also, the responsibility that rests upon us, as parents and guardians, to enforce, by strict discipline, their attendance at school. In the first place, as good citizens, it is our duty to do so. But we will not consider the subject from that standpoint. We will consider it from the standpoint of the child, maturing into manhood or womanhood, and

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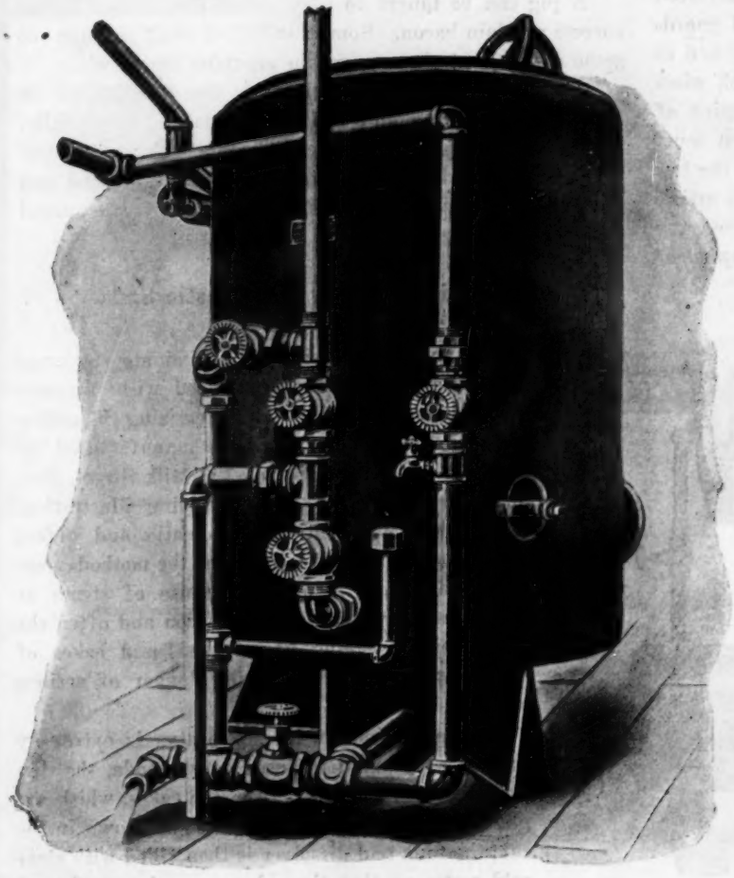

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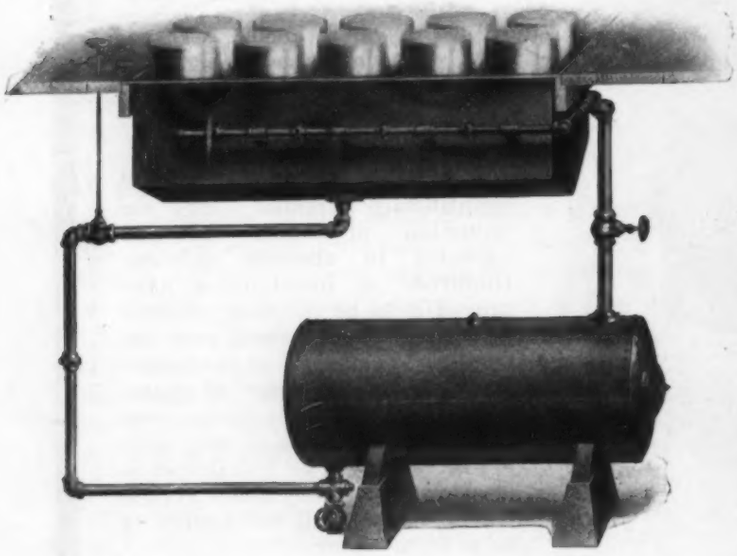
assuming the responsibilities with which we are now charged.

"It was indifference on the part of parents and guardians to their responsibilities in this regard that wrought into our federal statutes a law prohibiting the employment of children under the age of sixteen years. It is not the purpose of this article to discuss the merits or demerits of that law, although it is conceded many regard it unjust to be deprived the wages of their children. Cotton mills disclaim responsibility for the enactment of the law, just as they disclaim responsibility for that indifference referred to which prompted its enactment. If parents and guardians will not make their children go to school, they had as well work. This was the position cotton mills took when the law's measure was under consideration. The spirit of the law therefore is, that those who have children must send them to school. If all followed the spirit of the law and complied with its mandate, the writer of this article does not believe it would have a single protestant from any employing source. The difficulty is in having the *spirit of the law* enforced.



"Babies are born into the world whose future lives are to make it better or make it worse. No parent or guardian can escape the responsibility here impiled. We owe it to the child and owe it even more to the future man or woman to see that the child is trained at least in the essentials of a rudimentary education. This obligation was never so pronounced in the history of the world as it is today, and will be even more so as the present world-waged war continues. The children of today are to be the business men and women of tomorrow; those equipped for it will succeed; those handicapped by a lack of education will be the same as those similar unfortunates of today who were denied the privileges of educational guidance when they were young. It stands to reason, also, that the opportunities for success to the educated man or woman of the future will be far greater than those offered the present generation of employed. This due to the great toll of human life that is being exacted as a tribute of war, and which must logically result in a lessened number of those available for the higher stations of life.

"Should we not, therefore, be impressed, as never before, with the supreme importance of making our children go to school? If yea, then let's meet the issue squarely and instead of complaining at a law now on the statute books and by which we are bound, no matter what may be our views as to its wisdom or unwisdom, do our part toward vindicating its principles, by living up to the spirit as well as the letter of the law. It is up to us as parents and guardians. So lets send our children to school and make them apply themselves."

A pig can be taught to play poker, but he is a bigger success as plain bacon. Some men try to bluff through the game of life, but they never win anything worth while.

A man can be no better than his thoughts. What he thinks, he is. Let a man dwell on some subject continually, and he will change his mental complexion like the tree-toad.

Pour a spoonful of wine in a glass of water and you spoil the water and fail to make wine. Don't try to spread over too much territory.—*The Silent Partner.*

Automatic Dissolver for Caustic Soda.

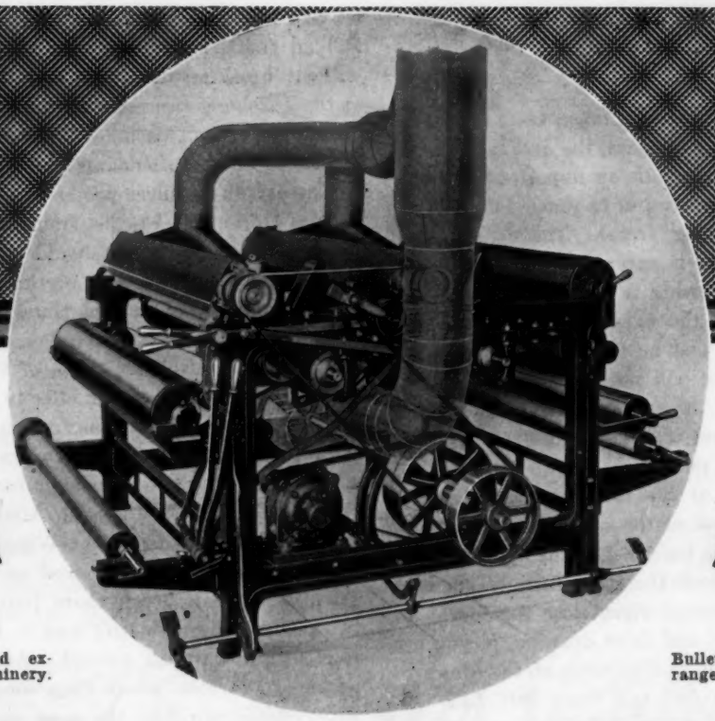
An apparatus designed to eliminate the usual dangers and difficulties connected with preparation of caustic solutions in mercerizing, bleaching and finishing plants, which is manufactured by The Walter E. Lummus Co., 173 Milk Street, Boston, is shown in the accompanying illustration. This dissolver is entirely automatic and offers many decided improvements over the methods generally employed, involving the use of steam or compressed air, mechanical agitation and often the troublesome breaking up of the fused cakes of caustic with the accompanying danger of serious burns to employees.

The operation of the apparatus is extremely simple; as adapted to fused caustic soda, the thin iron drums are stripped from the cakes, which are placed on the grid in the hopper, as shown in the cut; the tank and dissolver is then filled with clear cold water so that the cakes are submerged to a depth of about six inches. The solution of the caustic starts at once and is maintained by a patented system of circulation which continues without attention until the cakes are completely dissolved.

This apparatus was devised by a superintendent of a large chemical plant who was confronted with the necessity of preparing large amounts of caustic solution at regular intervals and who was keenly alive to the dangers and disagreeable features of this class of work.

Solutions of any required strength can be made without the use of steam or compressed air; there are no moving parts requiring power for their operation and liable to breakage. No attention is necessary other than the initial charging of the apparatus, which will automatically effect the complete solution of the caustic in about five hours.

The dissolver can also be charged at night with the assurance that the solution will be ready for use in the morning. For hot solutions, a thermo syphon attachment is provided. The device is manufactured in different sizes and is claimed to be a money saver.



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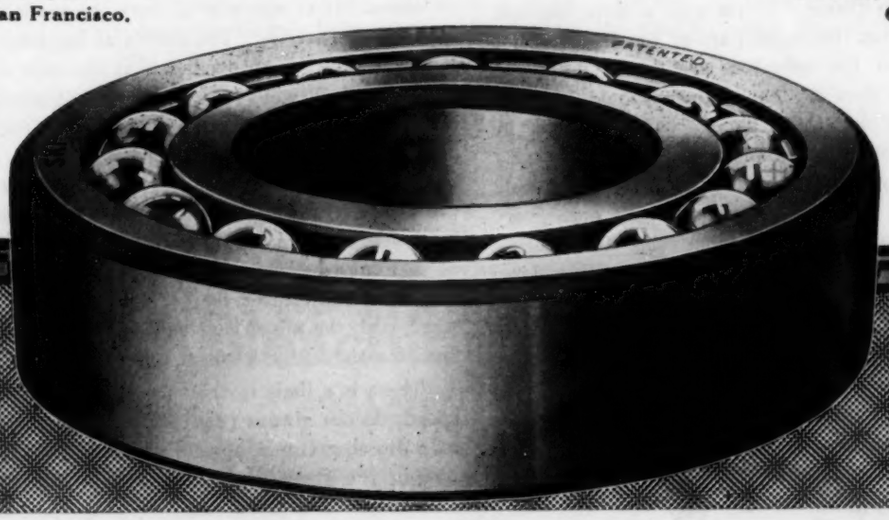

Drawing Frames.

EDITOR COTTON:

After the cans of sliver have been taken from the cards, or the combers to the drawing frames, the arrangement of the cans at the back of the frame is an important point to be considered. The usual practice is to place full cans of sliver behind the first drawing frame. This is all right for the first drawing, as there is never the same amount of sliver in the different cans, owing to the cards or combers being separate. Therefore, the cans will be emptied at different intervals, insuring that no two piecings will come together, and that the frame will not be stopped for any length of time. This is not the case with the second drawing frame, since in this case if a sliver broke the whole frame is stopped, and when one can is full all are full, and if empty cans are inserted at the front at the same time and all of the cans taken out at the same time and fed to the next machine at the same time, it is evident that all the cans will be emptied at about the same time. This is a defect owing to several piecings right close together. To remedy this, feed the second and third drawing, if you use the third drawing, in sections so that some of the cans will be full, some three-fourths full and some half full, and so on.

Top and bottom metallic rolls should receive careful attention to prevent what is called licking, or sometimes called lapping, which is very frequently caused by the flutes collecting and holding dirt. Therefore, metallic rolls require cleaning oftener than common rolls.

When using common rolls if the drawing frame stands idle anything like two days, they should be relieved of the weights. This helps to prevent the leather top rolls from becoming fluted. Common rolls should be varnished at frequent intervals, this depending on the varnish used and the weight of the sliver produced. Also the speed at which the rolls run. If any of the top rolls show signs of the flutes of the bottom steel rolls, they should be removed and a newly varnished roll put in the place of the one removed.

Sometimes when changing from heavy to light sliver the trumpet should be changed. On account of the sliver being so light and the small end of the trumpet so large. the friction and weight of the sliver is not sufficient to hold the trumpet in its proper position, therefore the frame will be stopping continually. There should be very little waste made at the drawing frame. If there is a large amount made it is an indication that some part of the frame is not properly adjusted, or the operators are not attending to their work as they should. The frames should be kept free from dirt, dust and short fibers. Oil should not be allowed in places where it is not required.

In order to produce clean work the operator should wipe or brush some parts of the frame about once every hour, such as the cover over the calender rolls, the trumpets and so on. The one in charge of the frames passing down the alleys should place his hand on the cover of the calender rolls and hold his hand on the cover from one end to the other. By doing this he will get all the short fibre, dirt, pieces of trash and everything which has collected on these probably for the last half hour; also instruct the attendants to do the same. Doing this saves a lot of ends from coming down, for after a lot of short fiber has collected at this point, the least little move will cause it to fall on the sliver right at the trumpet, and if it escapes without breaking down the end it will break down ends at the following processes on the slubber, intermediate and roving frames. This takes but very little time of the one in charge of the attendants and greatly helps to improve the quality of the silver produced.

Have all parts of the frame cleaned at least twice a day. The one in charge should go over the frames in his charge and see if there is anything like dirty, oily cotton collected on the collars and flutes of both bottom and top rolls. Do this at least once a day. This prevents cut sliver. Have all fast revolving parts of the frame oiled at least once a day, have a regular oiler to do this oiling and have every moving part about the frame oiled once a week. Have the top rolls taken out, if they are the metallic kind, once a week and laid across an eight-inch board as long as the frame. Take a piece of scrap cloth in one hand and hold the belt on the tight pulley. Wipe off all the dirt, oil and loose cotton that has collected on the bottom steel rolls. Then take a hair brush about four inches long and about two inches wide with stiff hair in the brush and scour the rolls length ways all around. After this is done oil the necks of the rolls where they come in the stands. Then wipe off the top rolls the same way and scour them with a stiff hair brush.

Take the bearings off the ends of top rolls. Have a small piece of wire bent in the shape of a "V"; have it bent close enough together so it will go through the bearings. Put a small piece of cloth on this and pull wire and cloth through the bearing. This cleans the bearing of all dirt, old oil and cotton, then oil the ends of the rolls and put the bearings back on them. Pull the sliver back across the bottom rolls and then put the top rolls back. See that all the oil holes are on top and all the weights are hung properly, then the ends are ready to put up. I have this done on my frames once every week.

Have all bolts, nuts and screws looked after and kept tight. All stop motions must be looked after and kept in good working order, as otherwise a great deal of bad work will be the result. Weighing the sliver is a very important matter and should be done at least twice a day, on fine work three and sometimes four times a day is advisable. If the weight of the sliver is properly adjusted at this point there will be fewer changes in the subsequent processes. It is also best to have the stock running evenly as early as possible. The guides at the back of the frame should always be arranged so that the ends at the back will be seprated as widely as the rolls will allow. Bad drawing results if the ends are not spaced sufficiently far apart and one end rides on another.

Both bottom and top clearers should be examined by the one in charge several times a day to make sure that the tenders are picking off the clearer waste. This should be done at least every two hours, for if the clearer waste is left on the clearer too long, it is apt to be drawn forward with the sliver and causes dirty slubs in the roving and unsatisfactory work at the future processes.

There is a limit to the speed of drawing frames. High speeds do not always pay. There is a limit to the capacity of a drawing frame, beyond which, the work done deteriorates or the excessive number of stoppages through break-

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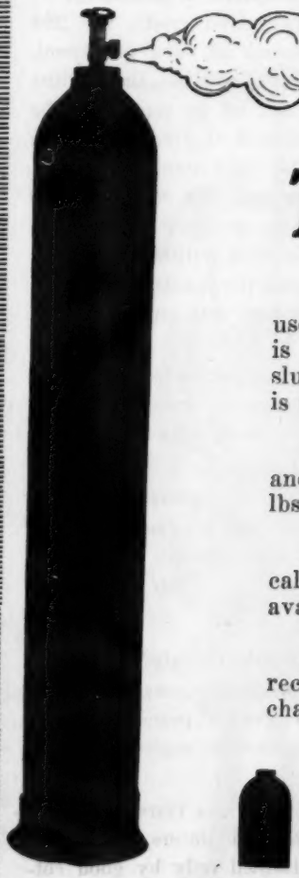

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You need no material changes in your present method of bleaching to use Liquid Chlorine. It is a very simple process and easy to handle. There is absolutely no loss in the preparation of the bleaching solution, and no sludge to dispose of. Less acid and less washing is required. Less water is used and no odor is apparent.

It is a highly purified and specially prepared chlorine. By refrigeration and compression, it is liquified and placed in steel cylinders containing 100 lbs. When released from the valve it immediately gasifies.

A chemical analysis of Liquid Chlorine shows it to be practically chemically pure chlorine gas. A good quality of bleaching powder contains 36% available chlorine, while Liquid Chlorine contains 100%.

1 pound of Liquid Chlorine is equal to 6 lbs. of lime. You will readily recognize how much money this will save you in both bleach and freight charges.

Our representative will gladly demonstrate Liquid Chlorine in your mill. Just ask us to send him.

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Electro Bleaching Gas Company

General Offices

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ages and stock running out prevents any advantage gained by an excessively high speed.

Drawing frames should be overhauled twice every year. At this time make sure that everything is cleaned thoroughly and both bottom and top rolls given a good scouring. If the necks of the bottom and top rolls are worn so there are little ridges on them, get some fine emery cloth, pour a little oil on it and rub the necks until they become smooth, and when they are put back see that they turn freely for if they bind they are very apt to break. See that all badly worn gears are replaced with new ones, and everything properly adjusted.

When this work is done see that all oil holes are not stopped up, for there is a lot of dirt which accumulates about a drawing frame. Clean all of these holes so they will take oil properly. By having this overhauling done as it should be, the frames will give little trouble between overhaulings. I have seen drawing frames run for six months without putting a wrench on them by having the overhauling done as I have stated.

Have this work done by a man who knows his business and see that the ends are not running too tight between the delivery roll and the calender roll. I have seen the fiber broken at this point. On the other hand, see that the ends do not run too slack at this point, for if they sag too low down they will drag on the trumpet and once in a while they will catch up and go through in big lumps, sometimes breaking down the ends. Also if they sag too much, the sliver will drag in all the short fiber, trash and dirt that falls from the sliver close around the trumpet, therefore, bad work will be the result in both cases.

See that the clearers over the calender rolls are kept covered properly, also the clearers under the bottom steel rolls and the ones over the top rolls. See that the coilers are plumb to the turn tables; see that the gears at the top and bottom of the upright shaft that drives the turn tables are properly geared up so the tables will turn as they should. This will allow the sliver to be coiled as it should be, which make it easier at the process following the drawing.

C. A. D. (N. C.)

A Bad Policy.

EDITOR COTTON:

There are many men in the mills today who trust their section hands too freely, thinking they are on the level as they should be. Sometimes an overseer wakes up to find that his position is threatened by such men. By this I mean that some men who have charge of departments let their section hands keep the time book, also let them hire and discharge the help. This, to the writer's mind, is a practice that all overseers should abolish, for the reason that there is many a good man discharged because of some slight misunderstanding between the section hand and this man, of which the overseer is unaware, thus losing a good hand.

Then, too, this section hand, or any other one, may have a friend for whom he is trying to land a job. This may be one of the many ways of discharging some good worker for the sake of giving his friend the job. This is a real fact, for it has happened, and the writer has seen it done many times.

Now, what I am aiming at is this, the overseer of the room in mind is a man who trusted some section hands more than others and had managed to make a pet out of one, this meant that whatever he heard, he would tell it all to the overseer. This section hand had charge of the spooling department, kept the weight of the yarn, and at the end of each week would hand it over to the overseer, who would figure out the pay of the tenders. There was one particular woman that he took a liking to, and that meant a little more weight, whether she earned it or not. Anyway, she always managed to draw more than the other spooler tenders every week. The overseer never got wise to this scheme. He always trusted the man and thought him on the level, until one day when the man was taken sick and another man was put on his job. The first day things went along just as smoothly as possible, but the second the woman found the new man was on to the scheme. The result was, she lost her job. It happened like this.

The new man counted 283 spools on her machine; after they were weighed she was given credit for 284 pounds at an average of one pound of yarn per spool, that is, they were pieces when she received them. She found a change in weight and ran off to report to the second hand, but when she mentioned the matter to him she mentioned 287 spools when the right number was 283. The second hand called the overseer, who came over to settle the case, and while telling the overseer her troubles she told him there were 283 spools, thus putting the second hand in danger. Then they counted the spools, found 283, figured the weight on the pieces and that on the spools, which gave her 284 pounds.

The following week when the other section hand returned they told him that his services were no longer required. The result is a few more dollars left in the office every week.

That is what I call pure robbery right under an overseer's nose and with him fast asleep at the switch. All he thought of from morning till night was production at any cost, and was getting it too, at a cost which nearly cost him his position. Tab (Mass.)

Our industrial life has been marked lately by a large growth in the ammunition and chemical plants, and without doubt many of them are to remain permanently, as these particular industries were somewhat neglected in this country.

Greatly advanced values of the various fibres mark the textile industries. Cotton waste and linters, especially, have reached values formerly attained only by good cotton. The diversion of cotton waste and linters to ammunition purposes has been the principal cause of the increased values, and to some extent the fire dangers of the mills have been reduced by the extra care given the waste.

The present values of all waste products tend to their better utilization, and waste industries now being built up are in general permanent, as they represent a necessary step in the economic development of our industries and have a favorable influence on fire losses.

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Can you *afford* to transfer half hose tops by *hand* in the *day-time only* when by using our

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this *Expensive Labor* may be *saved* and the machines run *24 hours*, thus more than

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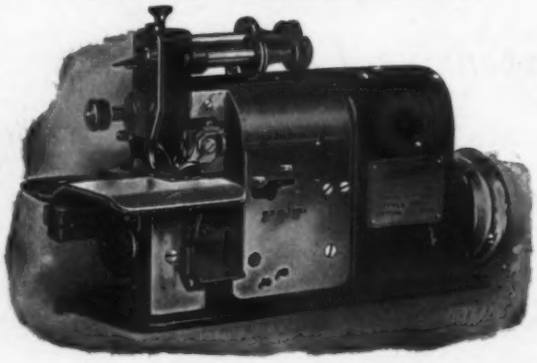

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USE STYLE 60S for welting Stockings, blind stitch.
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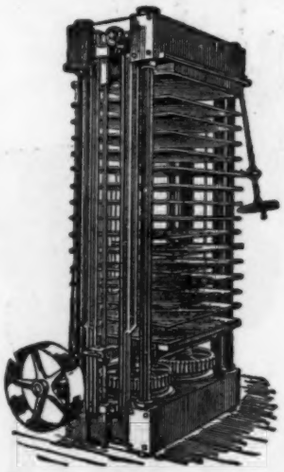

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Hosiery and Underwear

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FRANKFORD, PHILA.

Kinks for the Knitting Mill Man

BY HENRY K. DICK.

A mill man once remarked that "Eternal vigilance is the price of success" and you will agree with him. The knitting mill man, like any other mill man, has got to be on the alert. How can the knitting mill man be helped? He may want to increase the quality of his product. Yarns are high in price and anything which will help to keep down the percentage of seconds is welcomed more than ever before. More careful supervision at each step in the process of manufacturing will help in keeping down seconds. Some mills adopt the method of not paying the knitter for seconds while other mills pay for seconds on condition that the knitter separates them from the firsts. Any seconds found going with firsts under this ruling are not paid for.

There are two main sources of seconds; at the knitting machines and at the loopers. The cause of seconds at the knitting machines are usually caused by the needles themselves, loose rivets, bent latches, etc.

Girls for looping should be recruited from the toppers, but in a mill where ladies' hosiery is made, loopers have to be trained from the ground up, and it is a slow and costly operation. Good loopers are valuable to any mill. The cost of training a looper from the very beginning, if figured in dollars and cents might stagger the small knitting manufacturer if he only took the time to figure it out. Where loopers are recruited from toppers, they are more easily trained to looping, being already familiar with handling the small knitted loops and with their eyes trained to distinguish one row of loops from another. Green help in the looping department will make a lot of seconds and some of the work will be spoiled beyond usefulness.

Increasing the production is another important item to knitting manufacturers. Observing a line of hosiery machines supposed to be running at 230 revolutions per minute, out of 24 machines only 8 were running at the standard speed. The same pulleys were used on all the machines. The trouble lay with the belts. Some of the belts were only half-way on the tight pulleys and half-way on the slow motion pulleys. One machine showed a speed of 160; other speeds were 174, 190, 194 and 210. At a speed of 230 the machine would produce a pair of half-hose every 9 minutes or 400 pairs per week of 60 hours. When the speed was 160 which is 70 per cent of normal speed, this speed loss would only occur in the high speed portions of the stocking, the heel and toe being knitted at their normal speed. The loss is reduced according to proportion of time spent on heel and toe in relation to the leg, foot and top portions. From observation one pair was knitted in 9 minutes or 540 seconds. The time taken to knit the heel was 58 seconds as toe is made the same as the heel we would have to multiply 58 by 4 to get the time taken to knit the heels and toes for one pair. Deducting 232 seconds from 540 we obtain the time taken to knit the other portions of the stocking at high speed. This we find to be 308 seconds. But as the speed is only 70 per cent of normal on the high speed, the time taken would be greater than 308 seconds. To obtain number of seconds taken when running on slow speed, multiply 308 by 100 and divide by 70 the result is 440 seconds. Add to this 440 seconds the 232 seconds necessary for heels and toes and we get 672 seconds, the time required to knit a pair of half hose with cylinder speed of 170. Expressing the loss in per cent we find that there is a loss of 20 per cent in the day's production.

It might be argued that a condition such as this might not exist for any great length of time but the fact remains that such an evil existed and with careful supervision could be avoided. On this line of machines a speed variation of 33 per cent was found but was quickly reduced to 18 per cent.

Another strange incident developed on another line of half hose machines, on the same shaft, speeds of 230 and 250 were found. Each knitter was running 10 machines being supplied with transferred tops from two toppers. The knitter with a speed on the machines of 250 was getting off a much better production than another knitter on the same line due to the slight difference in machine speeds. The high speed knitter was turning off 10 half-hose every 4.33 minutes while his fellow knitter was getting off 10 half-hose every 4.62 minutes, making a difference of two dozen on the week's run, per machine.

Knitters do not like to knit the big sizes because of the longer time it takes to knit them. A ratio of production can easily be worked out, taking 200 needle work with about 30 courses per inch, the ratio would be as follows, calling 10½ inches 100 per cent. Then 10 inches = 101 per cent; 10½ = 100 per cent; and 11 inches = 97½ per cent. Therefore, in the same time, we could only expect 97½ per cent of 11 inch hose whereas we could get 100 per cent if knitting 10½ inch goods.

The following summary of a time study on 4 sets of machines may be of general interest. One hundred per cent production was calculated from the time taken to knit 3 stockings.

Cylinder	Size	Speed	100% for 60 hrs.	Actual production	Efficiency per cent
220	11″	234	30 doz.	27 doz.	90
200	10″	230	32.5 doz.	28 doz.	86
200	10½″	249	34.6 doz.	28 doz.	81
188	10″	234	33.3 doz.	32.5 doz.	97.5

As already mentioned, 100 per cent was figured on time taken to knit 3 stockings and from this a production was figured for 60 hours and called 100 per cent.

A plan adopted in some mills is to set a task for each knitter and when the knitter completes the task for the week, allow an extra price or bonus for every dozen knitted over the task. Suppose the task for a knitter to be 280 dozen at a rate of 4 cents per dozen and on every dozen over 280 to be paid for at the rate of 6 cents per dozen. This extra price is an incentive to increase production when an increased production is wanted. Increasing the production will decrease the overhead expense per dozen and this should be considered as a factor when an increase or bonus is given. If the task set for the knitter is too high, the knitter will be discouraged and the results will be the opposite from what we expect. Tasks should be set according to the ability of the knitter.

Another trouble in knitting rooms, is the control of sizes

ALWAYS FIRST WITH THE LATEST

BANNER

ALWAYS FIRST WITH THE LATEST

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HOSIERY MACHINES

More than 32,000 In Successful Operation

SIMPLICITY — SPEED — PRODUCTION

ALL PARTS ACCESSIBLE FROM FRONT OF MACHINE

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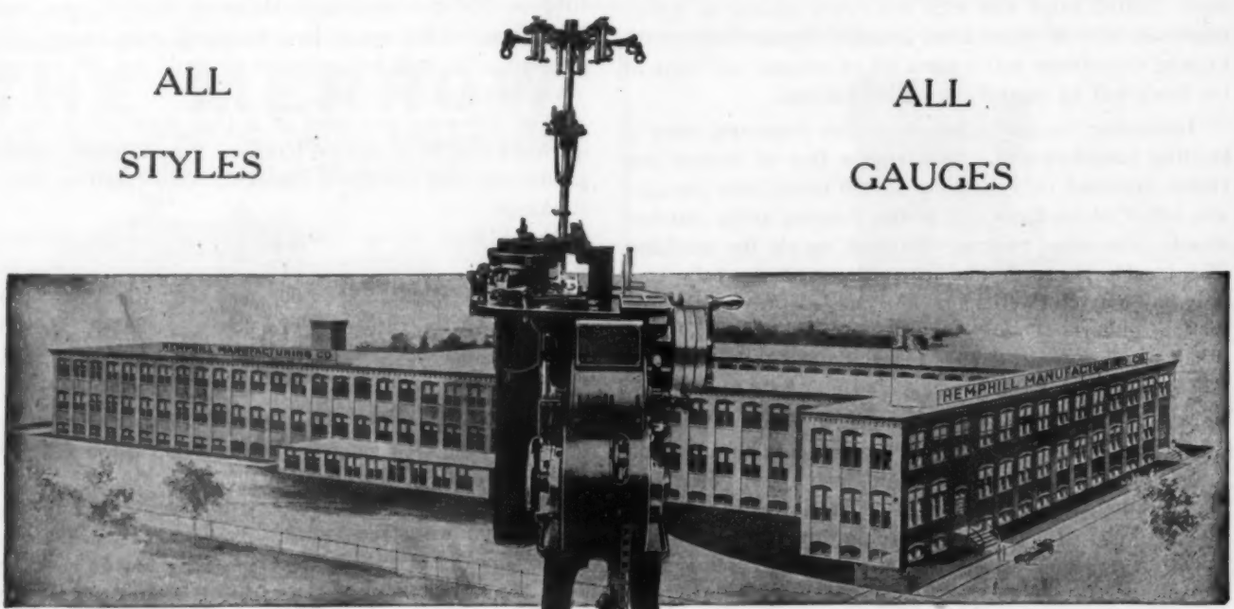

Over 100 Machines Completed Weekly for Home and Export Markets.

Write for full particulars and samples of work.

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ROOM 601, LEONARD BLDG., 350 BROADWAY, NEW YORK.

during a rainy spell. The stitch running tight and producing cut work. In a room where the humidity conditions were observed, the relative humidity was as high as 78 per cent. This was abnormal but it was one of the conditions which makes the work run bad and spreads discontent amongst the knitters. This evil was remedied by turning on the steam and drying out the room, and in a short time the work was running better. Knitting mill managers have not paid as much attention to humidity as they should. With automatic controll of humidity there would be less cause for re-adjustments of the stitch.

Why should knitters fail to test their yarn for correct counts? A knitter told me his hosiery was running 1 ounce to the dozen too heavy on 16 ounce goods, this is 6¼ per cent. When the suggestion of finding the counts of the yarn being used was made, neither yarn reel nor grain scales could be obtained. In a mill using from 3000 to 4000 pounds of yarn per week at prices ranging from 48 cents to 80 cents per pound, not a test was made to find whether or not the yarn was the right counts. This condition can be rectified by the purchase of a yarn reel and grain scales. Another point to which I would draw attention is the twist in the yarn. Too much twist is bad, so also is too little. Too hard a twist will intensify the cork-screwing effect in hosiery. Too little twist will cause the yarn to lack strength. Between those two points lies a happy medium for knitting yarn. The spinner may say there is a standard hosiery twist in the yarn and be correct in saying so. The staple of the cotton influences the amount of twist the yarn should contain. Supposing 12 turns of twist to be the correct twist for 18's hosiery yarn made from 1 inch cotton, this would not be enough twist for ¾ inch cotton and more twist would be required to give the yarn the necessary strength.

A reverse twist yarn is preferred to a regular twist yarn because the knitted fabric is knitted in the form of a spiral and the spiral leads to the right. To counteract this, reverse twist yarn should be used. When regular twist yarn is used the corkscrewing of the stocking is intensified. This is very noticeable in ladies' hosiery when hemming or boarding the stockings.

With attention to those points enumerated, the manufacturer will find improvements in his production and quality. He may also by careful examination find other points which he can rectify. A careful survey of manufacturing operations should be made in every plant at frequent intervals. This would tend to keep up the standard of the mill. This survey can be made by someone connected with the mill, but better results can be obtained by a disinterested party making the survey and the observations.

If there has been any point in the foregoing brief article which has proved helpful to the readers of these pages the obect of the writer has been attained.

Morton, Bailey & Company, Certified Public Accountants of Atlanta, announce the removal of their offices to 805-7-9 Hurt Building. This removal was made necessary to afford ample space for taking care of the increase in the business of this enterprising firm. They employ a staff of able accountants and invite their friends, when in the city, to call on them in their new quarters.

Pennsylvania Knit Goods Men Meet.

A plan for exchanging price and sales information was adopted at a meeting of Schuylkill Valley (Pa.) knit goods manufacturers in Reading on August 11, having been suggested by Edward Blood, Sr., of John Blood & Brother, Philadelphia. About 30 manufacturers—hosiery and underwear—were present, and those who were heard on the subject gave it their hearty approval.

Under the plan as outlined, manufacturers will send to the National Association of Hosiery and Underwear Manufacturers samples of merchandise which they have sold within a given period, the samples to be tagged with the price at which the merchandise was sold; the quantity sold, and the grade and number of yarn used in the knitting. As the samples are received they will be numbered, and with no other identifying mark, will be arranged for the inspection of the Association visiting the office. The samples will be exhibited at the various sectional and division meetings of the Association, and be made to serve in every possible legitimate way for informing members what their competitors report as to quantities sold and the invoice price.

All marks indicating the name of the mill or manufacturer from which the samples are received will be removed, making it impossible for any member to identify any sample but that which came from his mill. The Association will maintain a list of members submitting samples, the numbers on the list to conform to those on the sample tags. This list, which will afford the only source through which the name of any person submitting a sample could be ascertained, will be kept under lock and key, and would not be made available to anyone except with the unanimous consent of all parties interested, and then only for disposing of a dispute, should any arise.

In receiving and exhibiting the samples, the Association is to act only for the members cooperating. It was felt at the meeting that the extra clerical work and expense involved in the experiment would be fully justified, and the hope was held out that manufacturers generally might be persuaded to join in the project, which, it is believed by many, offers the nearest approach to a practical open price exchange yet conceived, as it will enable members interested to receive information as to not only prices, but quantities sold. By this means they will be better able to judge whether they are getting their share of the business and to form some idea of the volume of business per mill reporting, without knowing the name of the mill or manufacturer.

The plan involves no attempt to fix prices or regulate output. It imposes no obligation other than that of supplying an accurate answer to each of the several questions which each member cooperating will be expected to answer fully on the tag to be attached to the sample. It is intended solely for the purpose of furnishing generally trustworthy information expected to be of value in gauging the market from a distance. Members in sections remote from Philadelphia who desire frequent reports on the samples submitted will be given an opportunity to share in all the benefits to be derived from the carrying on of the exchange, provided they also contribute to the display of samples.

The meeting at which the sample-price exchange was launched was conducted by the Pennsylvania underwear manufacturers, under the auspices of the National Association, and was presided over by Edward Blood, Sr. The

TRADE MARK REG. U. S. PAT. OFF. PATENTED MAR. 31, 1908

FLATLOCK SEAM

Endorsed by the Governments of the United States and Great Britain

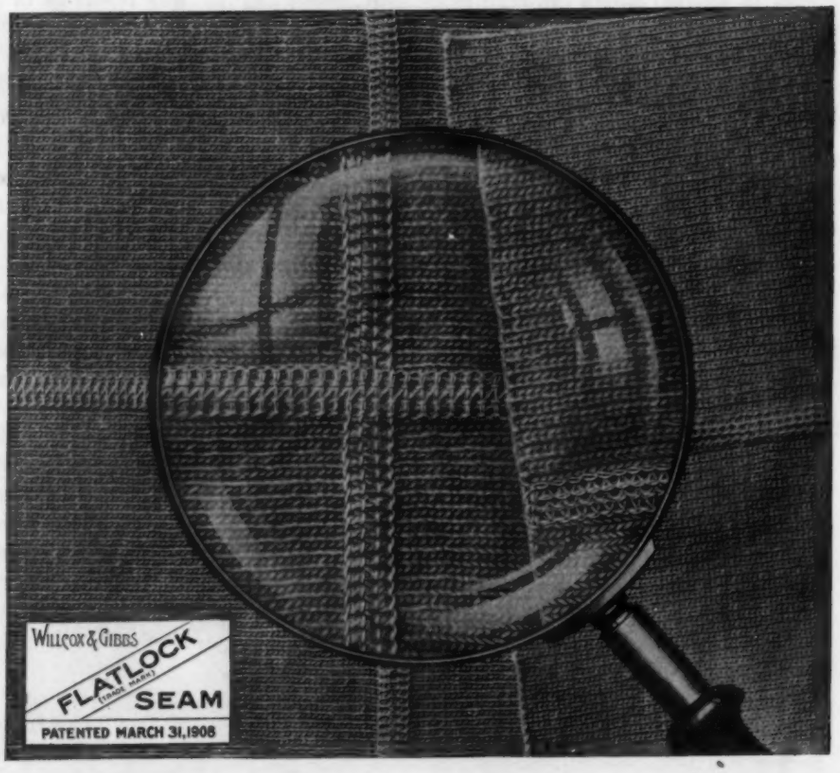
Last March the United States Government issued specifications for underwear, as follows:

**"All seams to be flat and double seamed except where FLATLOCK seam is used * * *
All stitching to be secure and strong, and not to ravel or pull out." (Specifications 55U1A)**

The FLATLOCK Seam is absolutely flat—a perfect union of abutted cut edges.

Any number of stitches in the Flatlock seam may be cut, but the seam itself *will not rip nor ravel when pulled in either direction.*

Over 160 manufacturers in the United States, Great Britain and Canada are now using the Flatlock Seam either exclusively or for the more important seaming operations in the undergarments they make. In Great Britain 60 manufacturers are Flatlock Seaming underwear for the Army and Navy.



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If the governments of these two great countries, the United States and Great Britain, so thoroughly approve the use of Flatlock Seam on military underwear, is it not fair to claim that underwear with the Flatlock Seam will prove more satisfactory and therefore more salable to the civilian customer and hence more profitable to the manufacturer than underwear seamed by any other method?

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meeting was open to Pennsylvania hosiery manufacturers, and a number were present. Charles E. Leippe, Reading (Pa.) Knitting Mills, submitted a complete report of the work of the committee which represented the Association at the recent hearing on the Federal Child Labor Act, before the Children's Labor Bureau of the United States Department of Labor. Manufacturers from many sections of the United States, representing a great variety of industries, were present at the hearing, and appointed a general committee to cooperate with the Department of Labor for reasonable regulation of the operations of the law. On this committee are Charles E. Leippe, Reading (Pa.) Knitting Mills; J. S. Carr, Durham (N. C.) Hosiery Mills, and W. Park Moore, Hancock Knitting Mills, Philadelphia. The chairman of the committee is D. Y. Cooper, Henderson, N. C. The other members are W. F. Careelon and J. L. Lawrence, Boston, Mass.; David Clark, Charlotte, N. C., and W. A. Erwin, Durham, N. C.

The meeting gave consideration to the subject of the care of employees in the military service of the government, their reinstatement after their return and the care of their dependents, and adopted the following:

RESOLVED. That it is the sentiment of the knit goods manufacturers here assembled that every reasonable effort should be made by employers to re-employ such of their employees as may enlist or be called for service in the military or naval establishments of the United States during the war when and as they return from such service; and that adequate provision should be made for the dependents of such employees during the term of service, but that no obligation for the care of such dependents should rest on the individual employer, but should be borne by the nation, state or municipality, or by public action.

The resolution is similar to that adopted by the National Industrial Conference Board and The Pennsylvania Manufacturers Association, and is in line with a suggestion from the National Association of Manfacturers.

A variety of views was expressed as to the light weight cotton underwear business for spring, one important mill reporting that it has taken comparatively few orders, those booked recently showing a price advance over those taken earlier. The mill is little concerned over what was regarded as light buying, an executive stating that the factory was well employed on a government order. "Perhaps we opened too late to get our share of the business," explained the mill executive.

This view was quickly dissipated by what several other manufacturers had to say, one reporting that while he had been in the market for some time he had not sold one-half as much as last year to August 10. Another mill was sold up to March, but the purchases had not been so heavy as last year.

"Another manufacturer reported: "We have all the business we can take care of and have rejected a number of orders."

Still another said: "I am afraid that we cannot expect to sell the usual quantity, if we are compelled to pay 62 cents for 30's double carded yarn."

A manufacturer who is paying 62 cents, against 50 cents when his lines for spring were opened, concurred in the view that the high prices of yarn are responsible to a considerable extent for the backwardness of buyers in taking as formerly.

A hosiery manufacturer stated that his mill would not sell a dozen for spring until it had cleaned up all of the orders on its books taken at low prices, and that when it did go out it would name prices commensurate with the then cost of yarn, regardless of the attitude of buyers. As at present advised, the manufacturer said, one of his lines of half hose, selling to the jobber last year at $2.50 probably will have to be priced at $3.50.

While it was the prevailing opinion that high prices next spring will not be the means of curtailing consumption, much stress was laid on the importance of restricting sales to as few months as possible.

More recruits in the campaign for having all shipments made f. o. b. point of origin were announced, and it was made apparent that the movement is spreading. One manufacurer reported that all of its invoices are printed in bold type: "Terms net 10 days, f. o. b. mill."

Asked as to how this was being received by the jobbing trade, he replied: "We can open our lines for spring and sell anything we can make on these terms, and we positively will adhere to the terms stated on the invoices."

One manufacturer stated that his mill allows freight deductions to commission merchants in New York, Boston and Baltimore only. On shipments to any other destination the consignee pays the freight.

A mill which allows its commission house in New York to deduct from invoices the amount of freight charges, it was stated by an executive, will discontinue the custom January 1 next if it be the sense of the Association that freight allowance be no longer made.

Military Underwear and the Flatlock.

Under Act of Congress, the Council of National Defense (of which Julius Rosenwald, of Sears-Roebuck & Co., is chairman of the division of supplies), some time ago appointed a knit goods committee as follows: Lincoln Cromwell, of William Iselin & Co., chairman; Frank H. Burgher of Bliss, Fabyan & Co., Andrew Frey of the Oneita Knitting Co., Edward L. Goodrich of Clift & Goodrich (selling agents for a large number of underwear mills), Frederick E. Haight, vice-president Superior Mfg. Co., Rufus W. Scott, of Scott & Williams, James S. Carr, Jr., president Durham Hosiery Mill, Leo M. Flesh, president Atlas Und. Co., Henry Pope, president Paramount Ktg. Co. These men will be recognized as broadly representative of the underwear trade.

The members of the knit goods committee serve without pay, and have given and are still giving much of their valuable time to aid in securing prompt delivery of millions of knit shirts and drawers for the soldiers and sailors, of the regular army and the army now being formed under the Conscription Act.

In the performance of their duties they first ascertained the plant equipment of the various underwear mills in the United States as well as in Canada which would be available for quick fulfillment of government orders, and in connection with this feature, it was essential that they should avail themselves of the experience of Great Britain in the vast work of equipping the soldiers and sailors of that country during the three years period of the war. They found that our government did not have full information on these points, and in the stress and hurry of military and naval preparations at Washington, it was im-

Circular Rib Knitting Machinery

PRODUCTS

Underwear, Sweaters, Cuffs with Cut Welt, Selvage, or French Welt, Mantles, Collarettes, Toques, Golf Caps, Hosiery Tops, Skirts, Borders, Corset Covers, Button Stays, Mittens, Bandages.

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Rectangular Slots, Hardened at Bottom, Sectional Caps and Cam Rings, Hardened and Ground surfaces, Sensitive Take-Ups, Two Speed Drive, Dogless Attachment, Positive Pattern Mechanism, Needle Guard and Protector, Automatic Stop Motions, Electric Cloth Cutters.

Characteristics

The characteristics of a knitting machine, like those of an individual, are determined by its origin and history; just as knowledge of the individual's family, schooling, and early life are desirable for the formation of an idea of his characteristics, so knowledge of the plant, personnel and ideals involved in the construction of the knitting machine are necessary for an understanding of its merits. Investigate the origin of our knitting machinery.

Wildman Mfg. Co.

ESTABLISHED 1889 **NORRISTOWN, PENN.**

possible to obtain samples of the British army and navy underwear.

In conversation with Frank H. Burgher during June, D. H. Bates, manager of the hosiery machine department of the Willcox & Gibbs Sewing Machine Co. (and himself a veteran of the civil war), told Mr. Burgher that the Willcox & Gibbs Sewing Machine Co. Ltd. of London, could probably obtain samples of the British army and navy underwear, and at Mr. Burgher's suggestion, a cablegram was sent to London. The London company replied that the samples would be procured and forwarded as promptly as possible, and they have now reached New York and after brief inspection by Mr. Burgher were sent to the headquarters of the knit goods committee, 357 Fourth avenue, for critical examination by the several members thereof.

The exhibit consists of seventeen undergarments made of cotton and wool which are representative in their fabric and general workmenship of the high standard set and maintained by the British government in providing for the highest efficiency of its military forces as far as underwear is concerned. Seven of the exhibits show the Willcox & Gibbs "Flatlock" seam throughout on each garment. There are now over 70 mills in Great Britain employing "Flatlock" machines, for army and navy purposes, but the demand for underwear is so great that the government is accepting Willcox & Gibbs "Overlock" seamed garments as well as "Flatlock" although the authorities prefer the latter. Some of the garments therefore show Willcox & Gibbs "Overlock" seams, but in most cases, the wristlets and anklets as well as rib tails are put on with "Flatlock" seams and we are told there is a distinct economy to the manufacturer in this because the work is done at 2,800 stitches per minute which is much faster than by the hand linking or looping process, and besides the "Flatlock" seam is stronger while the degree of elasticity is ample.

Knit underwear manufacturers in this country will be greatly interested in this helpful exhibit which may be seen at the office of the Willcox & Gibbs Sewing Machine Company, 658 Broadway, New York, at any time.

T. H. McKinney, Inc., of Atlanta, outbid a number of eastern and middle western contractors and secured the contract for the electrical work at Camp McClelland, Anniston, Ala., according to an announcement made recently.

The work at Camp McClelland will consist of the running of approximately 75 miles of pole lines and the installation of wiring for 30,000 interior lights. Most of the material to be used has been delivered and the work will start immediately. The contractor expects to work from 200 to 250 linemen and interior wiremen on this job and has arranged to house and feed at least 300 men on the grounds.

The S K F Ball Bearing Co., of Hartford, Conn., have just completed the mailing of a very interesting folder containing photographs of a number of prominent machine tool men, giving their opinion concerning the use of the S K F ball bearings on the various machines of their manufacture. The folder was prepared in a very unique manner and mailed in the form of a tube.

Calculations for Knitted Fabrics.

BY WILLIAM DAVIS, M. A.

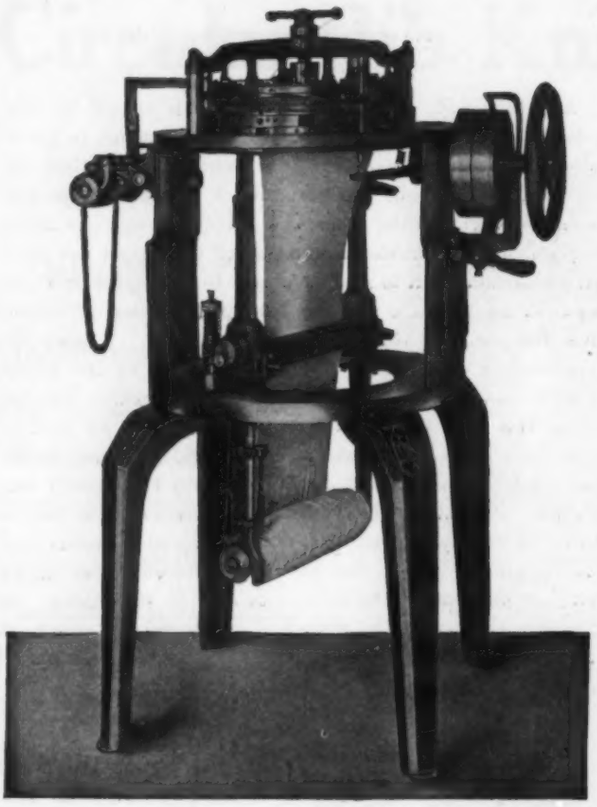
A considerable amount of confusion is caused by this system of counting the weight per yard and much in favor can be expressed regarding the continental method of calculating the weight per yard, which is always done per lineal metre, that is the fabric one metre wide and one metre long. This is quite clear in the case of the weight per yard but unfortunately it is also necessary to obtain the cost per yard per lineal metre and this has much greater difficulties from the point of view of the manufacturer. It suits the operation of cost finding admirably to work by the length of one yard of fabric no matter what the width may be. When this well recognized convention, upheld by facility in working has to be transferred to the cost per lineal metre, then we have a series of complications which are really formidable. To attain this result the manufacturer has to deal with the ugly factor of a metre being 39.37 inches long and in addition has to find the cost of his cloth per square metre, some idea of the difficulties may be recognized. As has been mentioned the matter is comparatively simple in the case of cloths which are entirely "square" in their structure, but these cases are comparatively rare.

THE LARGER TEMPLATE.

In using the larger template the previous considerations should be borne carefully in mind and if possible the pattern weighed should occur in a perfect square. When the pattern is large the result tends to be more accurate and many prefer the larger size as it enables them to use the dram and ounce weights which are better known to them and in some respects are more easily manipulated by workers whose arithmetical attainments are not of a very high order. There is a certain air of mystery about the grain which destroys the confidence of one who is not expert at figures. In the following examples the weights taken are the table 16 drams = 1 oz. 16 ozs. = 1 lb. or 256 drams per lb. The first operation is to calculate a series of constants for the new weights, having the length as one 36 inch yard and making out a list of numbers which can be used for a series of widths as given in the last table. Let the fabric be in the first case 40 inches wide and 36 inches in length, and let the weight in drams be designated by W, then the ounces per yard would be obtained as follows: If one square inch of fabric weighs W drams, find the ounces per yard of fabric 40 inches wide, 36 inches long. By proportion it is stated thus: 1 sq. in. : 40 x 36 sq. in. :: W : the answer. This gives the weight in drams per yard and to obtain ounces per yard the result is divided by 16, or stated in the one formula the calculation is

$$\frac{40 \times 36 \times W}{1 \times 16} = 90 \times W = \text{ozs. per yard.}$$

This means that for all fabrics of this width the ounces per yard are found by multiplying 90 by the weight in drams of a sample 1 inch square. The number 90 is said to be the constant for all cloths of this width. Working out the corresponding constant for a width of 56 inches gives a corresponding formula:



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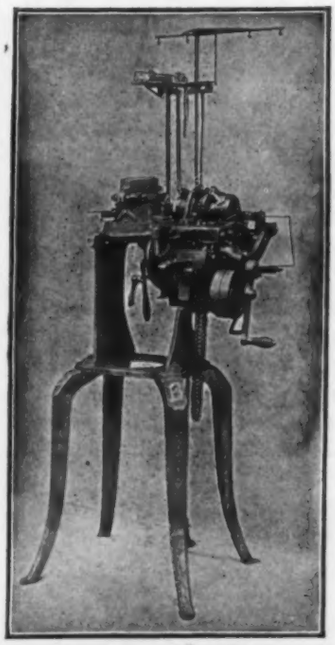

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$$\frac{56 \times 36 \times W}{1 \times 16} = 126 \times W$$ that is the constant is 126.

Working these out for each width, it is a simple proceeding to construct a table which will give the constants necessary for all widths from 40 to 64 rising by 2 inches at a time. Following is such a table of constants for calculating the ounces per yard for the various widths when the weight of 1 square inch of fabric is given in drams, length in every case 36 inch yard.

Width in Inches.	Constant.
40 inches =	90
42 inches =	94.5
44 inches =	99
46 inches =	103.5
48 inches =	108
50 inches =	112.5
52 inches =	117
54 inches =	121.5
56 inches =	126
58 inches =	130.5
60 inches =	135
62 inches =	139.5
64 inches =	144

Example 1. Find the weight per yard of a fabric 48 inches wide, one square inch of which weighs .1 dram. Consulting the table just given the constant for a width of 48 inches is 108 and the ounces per yard are given by $108 \times .1 = 10.8$ ounces per yard.

Find the weight per yard if a width of 60 inches weighs .18 drams. The constant for a width of 60 inches is 135 and the ounces per yard are given by $135 \times .18 = 24.30 = 24.3$ ounces per yard.

Give the weight per yard 42 inches wide if one square inch = .07 drams. The constant for 42 inches wide = 94.5 and the ounces per yard are given by $94.5 \times .07 = 6.6$ ozs. per yard.

It is evident that the working of this table as it stands has the disadvantage of requiring the weight to be in very small fractions of a dram and that if it is to prove generally useful, his lies in the direction of increasing the size of the template used. It will not be necessary to repeat the demonstration just given, for an examination of the figures will show that to obtain another set of constants, all that is required is to divide the constant given for the area of 1 square inch by the area of the new size of pattern cut. Thus the constant for a width of 40 inches is 90 and if a similar number is required for an area 2 inches by 2 inches = 4 square inches, then the number 90 will be divided by 4 = 22.5, the new constant for a template of 2 inches square. If the weight of this area were given as .5 drams then the weight per yard would be $22.5 \times .5 = 11.25$ ounces per yard.

The table given can be extended to show all constants occurring between the widths 40 to 64 inches in a range of pattern sizes from 2 to 16 square inches and these series will embrace the case of patterns which are not cut to a given size of template but which are measured just as they are, the edges being trimmed to insure that they are straight. This has one advantage which is that the sample can be measured as it lies, and the weight taken in drams and fractions thereof. This obtained, the constant for that area or dimension may be secured from the table and a simple multiplication of the drams into the constant for the width required will give the ounces per yard. A table of this kind can be used with accuracy and success by any operator however inexperienced, the only requirement being a knowledge of ordinary arithmetical operations. All the values of the table have been deduced from the last given list by dividing the constants given for an area of 1 square inch by the new areas from 2 to 16 square inches. For example the constant for 40 inches wide, 1 square inch area is stated as 90 and to obtain the first column of the following table this number is divided by each number from 2 to 16 in turn thus:

$$\frac{90}{2} = 45 \quad \frac{90}{3} = 30 \quad \frac{90}{4} = 22.2 \quad \frac{90}{5} = 18 \quad \frac{90}{6} = 15$$

An examination of the first column of the table will show that these are the values in column 1 and if the numbers in the other columns be tested, it will be found that they are deduced in exactly the same manner.

WIDTH IN INCHES.

CONSTANTS FOR ALL AREAS OF CLOTH FROM 1 TO 16 SQUARE INCHES OF FABRIC.

AREA	40	42	44	46	48	50	52	54	56	58	60	62	64
1 sq. in.	90.	94.5	99.	103.5	108.	112.5	117.	121.5	126.4	130.5	135.	139.5	144.
2 sq. ins.	45.	47.2	48.5	51.7	54.	56.2	58.5	60.7	63.	65.2	67.5	69.7	72.
3 " "	30.	31.5	33.	34.5	36.	37.5	39.	40.5	42.	43.5	45.5	46.5	48.
4 " "	22.2	23.6	24.7	25.9	27.	28.1	29.2	30.4	31.5	32.6	33.7	35.	36.
5 " "	18.	18.9	19.8	20.7	21.6	22.5	23.4	24.3	25.2	26.1	27.	28.	28.8
6 " "	15.	15.7	16.5	17.2	18.	18.7	19.5	20.2	21.	21.7	22.5	23.3	24.
7 " "	12.8	13.5	14.1	14.8	15.4	16.1	16.7	17.3	18.	18.6	19.3	20.	20.6
8 " "	11.2	11.8	12.4	12.9	13.5	14.	14.6	15.2	15.7	16.3	17.	17.5	18.
9 " "	10.	10.5	11.	11.5	12.	12.5	13.	13.5	14.	14.5	15.	15.5	16.
10 " "	9.	9.4	9.9	10.3	10.9	11.2	11.7	12.1	12.6	13.	13.5	14.	14.4
11 " "	8.2	8.6	9.	9.4	9.8	10.2	10.6	11.	11.4	11.8	12.3	12.7	13.1
12 " "	7.5	7.8	8.3	8.6	9.	9.4	9.7	10.1	10.5	10.8	11.3	11.7	12.
13 " "	7.	7.3	7.6	8.	8.3	8.7	9.	9.3	9.8	10.	10.3	10.8	11.1
14 " "	6.4	6.7	7.	7.4	7.7	8.	8.3	8.7	9.0	9.3	9.8	10.0	10.3
15 " "	6.	6.3	6.6	6.9	7.2	7.5	7.8	8.1	8.4	8.7	9.	9.3	9.6
16 " "	5.6	5.9	6.2	6.5	6.7	7.	7.3	7.6	7.9	8.1	8.4	8.7	9.

To obtain the ounces per yard (36 inches) note the constant at the width required and also the size of pattern cut, when the ounces per yard will be given by the constant multiplied into the weight of the pattern in drams and fractions thereof.

Example 1. Find the ounces per yard 49 inches wide of a knitted fabric of size 8 square inches which weigh .8 weighs .75 drams. Referring to the table along the line marked 4 on the left and in the column for a width of 48 inches we find that the constant is given by the number 36. The weight in drams is .75 dram and the ounces per yard is therefore given as $36 \times .75 = 27$ ounces per yard.

Example 2. Find the ounces per yard 50 inches wide of a knitted fabric of size 8 square inches whicch weigh 8 dram. Referring to the table along the line marked for 8 square inches and down the column for a width of 50 inches shows the number 14 and the ounces per yard are therefore $14 \times .8 = 11.2$ ounces.

Example 3. Find the ounces per yard 56 inches wide of a fabric of which 2 square inches weigh .25 dram. Referring to the table along the horizontal line for 2 square inches and along the vertical line for a width of 56 inches, these two intersect at the number 63 and this is the constant. For the ounces per yard: $63 \times .25 = 15.75$ ozs. per yard.

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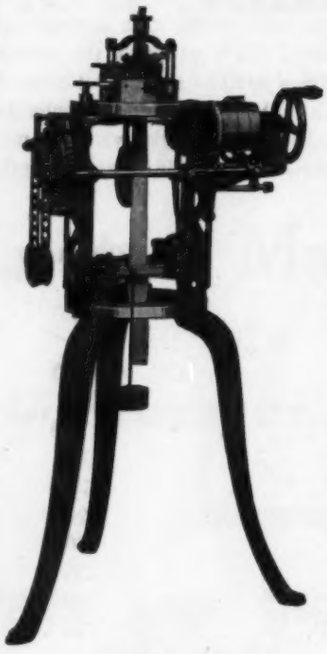

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Example 4. Give the ounces per yard, 52 inches wide of a pattern 5 inches wide by 3 inches long which weighs .9 drams. (5 by 3 = 15 square inches.) The constant is seen to be 7.8 in the table and the ounces per yard = 7.8 × .9 = 7.02 ounces.

Example 5. The weight of a knitted fabric 4 inches wide and 2½ inches long is found to be .73 drams, find ounces per yard 42 inches wide. 4 by 2½ = 10 square inches. Constant from table is 9.4 ounces per yard = 9.4 × .73 = 6.86 ounces.

Example 6. A pattern 4 inches by 3½ weighs 1.1 drams, find the weight per yard for width of 50 inches. Area = 4 × 3½ = 14 square inches. Constant of fabric 50 inches wide is 8, ounces per yard = 8 × 1.1 = 8.8 ounces per yard.

If these results are tested by the long method of ordinary calculation, it will be found that the table gives great accuracy and these examples will show its great scope of usefulness and the facility with which the various calculations can be worked out in connection with the weight per yard for any length of knitted fabric. As has been already pointed out, care should be taken in finding the weight per yard of a knitted fabric where the length and width are in different figures. It is advisable to cut the patterns to the nearest square as there will then be no doubt of the accuracy

The Knit Goods Market.

A substantial improvement in the hosiery market has developed in the last week or two, and underwear too has felt the effect of a keener interest among buyers. Manufacturers in the main have held out firmly against what seemed like a concerted scheme for hammering prices, at last forcing buyers to come to the front. Only a grudging interest among the latter is shown, however, but with some duplicate fall orders coming in and buyers waking up to the danger of further delaying their spring orders, lest they have difficulty in getting merchandise at any price, there has come a far better all-around feeling.

Mill agents, whose livelihood depends upon the volume of their commissions, have been the chief complaining element in the sagging market of a month or more, and some of these, in the hope of getting business for their mills have tried to make it appear that downward revision of prices was necessary for starting things. Fortunately for the manufacturers, they were able to keep their mills running to help capacity on spot business and in the completion of old orders. In doing the latter some mills are shipping at a loss. This has been proved in several instances.

The shrewd jobber has been getting the advantage of the continually advancing market. Merchandise bought months ago at what now seem like low prices is being sold on the basis of replacement value. Most of this has been cleaned up, so that there are no stocks of any moment and the ways are cleared for good mill business for the winter months in getting out stuff for spring.

Jobbers have been making money—more than at any time in the past—and are well able to speculate on the future, if risking only their profits of the last season. That some of them feel this way about it is apparent to a number of manufacturers in confidential admissions by a customer now and then. The smaller distributors, whose profits do not justify the taking of any great chance, constitute the element that must go slowly, particularly from the fact that to buy as many dozens as they bought a year ago would require almost twice as much capital. This is a situation that is causing manufacturers and distributors to watch credits more closely, and commercial reporting agencies never had more requests for information.

Jobbers necessarily have been influenced in their waiting policy by the attitude of retailers, who, fearful that high prices would result in diminished consumption, have been operating with extreme conservatism. The pulse of the retail trade was felt in the last several weeks by several underwear mills selling to retailers exclusively and who opened their lines for spring since August 1. These mills report retailers taking in limited quantity, but as showing more confidence than in the past, and a very large duplicate business seems assured. The mills are not urging heavy buying, yet warning their customers that it might be well to anticipate their wants so far as possible with a reasonable degree of safety.

Hosiery buying should be on in earnest by mid-September. Every now and then a manufacturer who has tried to stay out of the market until the last moment is naming prices for spring, and the sales by these mills are encouraging others to get into line. Some will ignore the matter of a formal opening, taking business on the catch-as-catch-can plan and restricting their yarn purchases to their needs as they can see them.

In the later announcements by mills some startling price advances are disclosed. H. A. Romberger, operating four Pennsylvania mills from his office in the Philadelphia Bourse, several weeks ago notified all of his agents and customers of an advance to $2 per dozen for infants' fancy socks of full mercerized or mercerized top and combed peeler body. This is a jump of 25 cents since July. The same line was sold to jobbers at 75 cents in the spring of 1915. A mercerized number which sold at 67½ cents in 1915 and $1.45 in July last has been advanced to $1.75, while another mercerized number is up to $1.85, against $1.50 in July and 70 cents in 1915. An all-cotton number priced at $1.25 in the new schedule was moved up 15 cents since July. This number went to jobbers at 62½ cents two years ago. The mills get 10 cents extra for sizes 8½ to 9½.

Manufacturers of ladies' mercerized hose are far apart in their estimates of what constitutes a fair selling price. Quotations on 300 needle goods range from $2.60 to $3.15 on size 7. Some manufacturers provide for a 10 cents rise and fall, others a 10 cents rise and 5 cents fall. A price named to a Philadelphia jobber was $2.60, rise and fall 10 cents. The same house had a quotation from another mill of $2.75, rise 15 cents and fall 10 cents.

There is practically no market price on ladies mercerized such as might be accepted as a guide in offering this class of merchandise. Some mill agents declare they cannot sell a case of mercerized hosiery at prevailing prices. Yet the fact remains that a mill making seamless fashioned hosiery for ladies and operating nearly 1,000 knitting machines is disposing of all it can make. This line retails at 50 cents, but it is a question whether it will not have to be moved up for next year.

Jobbers report that their best business comes from the rural districts, that the farming communities are showing a greater degree of confidence than the merchants in the

larger cities, where the small merchant may be at some disadvantage in competing with the department stores. A number of the latter are known to have stocked up heavily, while a few have given instructions to their buyers to not buy until they must and then pay the price. As probably a majority of the manufacturers are pursuing the same policy as to yarns it is apparent that, unless there should come an unexpected break, late buyers will pay higher prices than now prevail, and their tardiness will be a factor in next year's retail high prices.

As indicating the flights which underwear prices are liable to take, a Tennessee mill a week or two ago sold through its New York office 25 cases of seconds of its 10 pound separate garments at $5.75, which was $2.25 above the opening price nine months ago. This mill is reported getting $11.50 for its 16 pound cotton ribbed union suit and $10.75 for its 14 pound suit. Another mill is understood to have sold a 15 pound cotton ribbed union suit at $10.50. The Tennessee underwear mills are reported sold well up and not eager for business except at prices based on replacement values, with a reasonable margin for safety, the belief prevailing that costs must advance with the operations of the Federal Child Labor Act and further heavy takings of garments for the army and navy.

About the middle of August the Gardiner & Waring Company and A. V. Morris & Sons, both in Amsterdam, N. Y., were given orders for undershirts and drawers aggregating 900,000 garments, at 48 cents per garment. Practically the same type of underwear was sold last year to jobbers at $3.50 per dozen. The government is paying on the basis of $5.76.

Mills employing night shifts are confronted with materially heavier operating costs. It is pointed out by one manufacturer that at the rate at which his male help is going into the military service he probably will have to discontinue operating nights, thus increasing his overhead cost. In addition, the men employed by night are the least efficient, the better class of help given preference and selecting day work. The transfer of night help to the day force will either improve the former or impair the efficiency of the latter. The greater the number of night workers in proportion to day help, it is stated, the more seconds will the mill have to dispose of. A law of the state in which the manufacturer referred to is operating forbids the employment of women after 10 o'clock p. m. But for this the mill might have little difficulty in continuing the night shift.

A recent canvass of knitting mills on the question of shipping terms reveals a decided preference for shipment f. o. b. mill railroad station and no freight or cartage allowance. Of approximately 200 mills voting, 151 recorded their opposition to the allowances and their approval of f. o. b. mill shipments exclusively. Nearly all of those taking the opposite stand on both questions are believed to have been fearful of the effect of undertaking to change their trade customs. Nearly all agree in the proposition that to ship otherwise than f. o. b. mill or pay the customer's freight or cartage is unnecessary and illogical, and it is held that the time for a reform is opportune.

Southern mills are divided on the subject, some manufacturers in that section saying they fear they could not compete with mills in the North and West for New York or Chicago business unless they continued the concessions which they hitherto have been granting. On the other hand, nearly every large Philadelphia mill selling in the south grants no freight or cartage allowance and ships f. o. b. Philadelphia. In this class are the Hancock and Fidelity Knitting Mills and Harry C. Aberle & Co., also the Berkshire Knitting Mills, Reading, Pa. The latter recently had all of its invoices reprinted to specify f. o. b. mill.

The matter is being agitated by a number of trade associations, practically all of which take the majority view expressed in the recent canvass of knitting mills, and it begins to look as though mills are going to relieve themselves of liability for merchandise after it has been delivered to a transportation company and that freight and cartage will follow the merchandise. A number of knitting mills which have put the reform into effect within the last year report that it has caused them no loss of customers or diminution in business.

The Autogyp Process of Dyeing.

BY A. F. MUSGRAVE.

One of the more important improvements in the field of dyeing light shades during recent years has been the introduction of the patented Autogyp process. This process, which is especially suited for light shades which must be dyed over a bleached bottom, combines in one bath both the functions of bleaching and dyeing. The manufacturers of knit goods who have been in the habit of dyeing Egyptians and other light shades over a lime bleach bottom have been quick to adopt this method owing to the many advantages which it offers. While it may seem highly improbable to the average mill man, it is possible by this method to eliminate the use of chloride of lime with its attendent worries and dangers and perform the whole operation of bleaching and dyeing in one liquor.

The bulk of the knit goods are dyed in light shades, running from Egyptian to light blue, and these goods, being manufactured principally from carded yarns, are so specky that it is necessary to remove the motes before a clear shade can be produced. Up to the present this has been accomplished by boiling the goods in an alkaline bath composed of soda ash or caustic soda, followed by a treatment with chloride of lime. The specks were all removed in the lime bath and it was then necessary to rinse, sour, rinse again and then dye. It therefore required about seven different steps in order to turn out a batch of goods. The Autogyp process requires but one bath to produce a dyed fabric which is just as clean and considerably softer to the feel.

A brief comparison of the two methods will show the length of time consumed by each. In the chloride of lime method, which is here outlined, the writer is assuming that the goods are bleached and dyed in the same kettle. While this process is largely used, there are many mills who boil out overnight in a kier, then pass the goods through lime and then into the kettle where they are to be dyed. When the Autogyp process is compared with this latter method the saving in time is from 12 to 17 hours or about 80 per cent. When compared with the one kettle process the saving in time is 50 per cent. There are some savings however which cannot be measured in time but these will be discussed later.

LIME BLEACH METHOD.

	Total Time
Soda or caustic boil	1½ hrs.
Two to three rinses	¾ hr.
Hypochlorite bath chloride of lime)	¾ hr.
Two rinses	½ hr.
Sour	½ hr.
Two rinses	½ hr.
Dyeing	1 hr.
Total time	5½ hrs.

AUTOGYP METHOD.

Autogyp and autogyp assistant	1½ hrs.
Dyeing (dyestuff added to above bath)	1¼ hrs.
Total time	2¾ hrs.

A saving of one boil as well as 2¾ hrs. of running time can be noted by perusing the figures shown, but the figures do not plainly show all the advantages of the new method. By citing some of the difficulties which are experienced in the dyeing of Egyptians and other shades by the old method it can more easily be shown how the autogyp process eliminates these troubles.

Probably the greatest drawback to the old method, aside from the length of time which it required, was that it was necessary to use such a generally unsatisfactory product as chloride of lime. There is no doubt that chloride of lime has been responsible for more tendered goods than any other chemical in the dyehouse. Aside from the danger which lies in the use of this product, when improperly handled, is the great personal discomfort which is caused by its extremely penetrating odor. Any dyer who has dyed Egyptians over bleach of chloride of lime will agree with the writer when he states that it is almost impossible to bleach two lots of cloth to the same degree. This means that when the goods are dyed that the batch which was best bleached will come up lighter than the other and it is thus an extremely difficult matter to keep the batches uniform in color. The average dyer when making up chloride of lime solutions depends upon the hydrometer as an indication of the strength of the solution. The hydrometer however will not indicate the bleaching strength of the liquor and two different solutions, both of which would Twaddle 14 degrees, might be far apart in their relative bleaching power. This is the reason that it is so difficult to bleach several batches to the same degree.

Another fact which is very important is that it is extremely difficult to dye goods evenly over a chloride of lime bleach.

The autogyp process, which is noted for the extreme simplicity, is carried out in the regular reel dyeing machines, no kier being needed. A brief survey of the process, as it has been worked by the writer in several mills of the north is as follows:

The goods are put into the machine and then 5 per cent autogyp and 1½ per cent autogyp assistant is added. These percentages are figured on the weight of material. The bath is then brought to the boil in about ¾ hour and the boiling continued for another ¾ hour. The steam is then shut off and the dye, previously dissolved in water, is added. The goods are then run for about 15 minutes without steam. The bath is then brought to the boil again and the boiling continued for ½ hour. The process is then finished and the goods are given a rinse and extracted. Not all dyes can be used in this process, but the manufacturers of autogyp have selected a line of dyes which will produce all the regular knit goods shades.

Owing to the fact that the autogyp and the autogyp assistant are always pure, it is a foregone conclusion that the different batches will all be bleached to the same degree. It is thus very easy to keep the shade alike through the entire season. It has also been noted that the autogyp assistant has excellent levelling properties and with a proper selection of dyes it is an easy matter to secure level dyeings.

Much more could be written about this interesting method but lack of space prohibits, enough however has been said to show its immense superiority over the old fashioned method. Autogyp has been patented in the United States and Canada by the Surpass Chemical Co., Inc., of Albany, N. Y.

Among the Knitting Mills.

The May Hosiery Mills at Burlington, N. C., have purchased the plant of the Scott Mebane Co., according to local reports, and will install a finishing plant for the hosiery manufactured in their present mill. Work of preparing the building and installing machinery is now in progress.

Another Burlington addition to the knitting industry is a hosiery and finishing mill chartered as the Piedmont Finishing Mill. This company is capitalized at $50,000 and will take over the old Midway Hosiery Mill plant, to which an addition is to be built.

The new hosiery mill to be built at Greensboro, N. C., by J. E. Latham Company is to be taken over by a corporation organized for the purpose. Machinery and equipment have already been purchased and it will be in operation in the fall.

Construction of the new building for the Paramount Hosiery Form Drying Co., at Waupun, Wis., is being pushed rapidly. This is an additional plant to the one now in operation at Beaver Dam, Wis., and is necessitated by the rapid increase in business.

The D. S. & W. Hosiery Company, Reading, Pa., has had plans prepared for a new four-story hosiery mill, 50 x 100 feet, on Moss Street, to cost about $25,000. George L. Gerhard & Son, 619 Penn Street, are the architects.

The Utica Knitting Company, Erie Street, Utica, N. Y., manufacturer of underwear, is building an addition to its plant.

The Scranton Textile Company, Penn Avenue and Poplar Street, Scranton, Pa., manufacturer of underwear, has received a large order from the Government, and plans for increased facilities. The company has doubled its force of employees and is now operating day and night shifts.

The Richmond Underwear Company, Scranton, Pa., is planning for extensions in its plant on Capouse Avenue to double the present capacity. The company maintains New York offices at 47 West Thirty-fourth Street. Bertram Baker is president.

The Holeproof Hosiery Company, Milwaukee, Wis., with New York offices at 1007 Broadway, has awarded a contract to W. W. Ceflein, 86 Michigan Street, Milwaukee, for the construction of two additions to its hosiery manufacturing plant at a cost of about $200,000. The structures will consist of one six-story building, 85 x 150 feet, and one-story, 70 x 100 feet.

The Loraine Knitting Mills, Inc., New York, N. Y., have been incorporated with a nominal capital of $5,000 to manufacture hosiery, underwear, etc. L. Smith, I. Fein and P. Scheftel, 59 Dresden Street, New York, are the incorporators.

The Walnott Knitting Company, 5 Blandine Street, Utica, N. Y., manufacturer of knit underwear, is building an addition to its mill.

The West Branch Knitting Company, Lock Haven, Pa., is making extensions in its plant to increase the present capacity.

The Pennsylvania Knitting Mills, 357 Forth Avenue, New York, has secured a contract from the Government for 148,000 cotton undershirts for army use at a cost of about $71,000.

The Moorehead Knitting Company, Cameron and Walnut Streets, Harrisburg, Pa., has installed new machinery and made improvements in its mill, during the annual vacation period granted to employees. The former capacity of the plant will be increased. The company manufactures hosiery and other knit goods.

The Clayville Knitting Company, Clayville, N. Y., manufacturer of knit underwear, is making extensions in its plant for increased operations.

Taubel Brothers, Cedar and Huntingdon Streets, Philadelphia, Pa., manufacturers of hosiery and knit goods, have acquired the factory of the Knipe Knit Goods Company, Hatfield, Pa., and will operate the plant as a branch hosiery establishment. It is said that the present capacity of the factory will be increased.

The Interwoven Mills, Inc., 390 George Street, New Brunswick, N. J., manufacturers of hosiery, will build a new one-story addition to its knitting works at Martinsburg, W. Va. The extension will be about 90 x 90 feet, and cost $30,000.

The Royal Knitting Mills, Chicago, Ill., is making extensions in its plant to increase the present capacity.

The Bristol (Tenn.) Hosiery Mills have decided to construct an additional building which will be equipped for dyeing hosiery. Plans for future increases provide for a daily output of 2,000 dozen pairs during 1918.

The O. K. Knitting Mills, Inc., New Orleans, La., have filed a petition in voluntary bankruptcy, scheduling liabilities of $281,499 and assets of $164,803. David M. Davis has been appointed receiver by Judge Foster of the United States District Court, on the application of the attorney representing five local banks.

Paragon Knitting Mills, Oklahoma City, Okla., is to be organized with a capital of $250,000, and soon propose to erect and operate a knitting mill to manufacture an exclusive line of ladies' hosiery under the trade name of "Indian Brand Hosiery." A. W. Thornley will be manager of the firm, and will be in the market for machinery, yarns and supplies. He may be addressed at 707 Colcord Building.

The Fulton Hosiery Mills has leased 11,000 square feet of space in the top floor of the Loft Building at 41 S. Forsyth Street, Atlanta, and have started manufacture of misses' and children's ribbed hosiery. This is a branch of the United Hosiery Mills at Chattanooga, Tenn., and is one of a chain being established in Southern cities. The goods are made in the gray only and then dyed and finished at the Chattanooga plant. Scott & Williams machinery is used and additional equipment will be purchased from time to time until the entire space is occupied. This branch plant is in charge of Superintendent F. C. Nicholson, who advises that he has a position open for an experienced Hepworth looper fixer.

W. O. Burgin, of Lexington, N. C., is understood to be planning the establishment of a knitting mill, and he is now corresponding with the manufacturers of machinery for this work.

Unshrinking Knitted Underwear.

The process of unshrinking worsted and cashmere underwear has now become so general that even the most conservative of manufacturers have been compelled to give up their prejudices, and adopt some chemical method of rendering the goods unshrinkable.

Formerly, it has been asserted that if goods were made to their proper size, and that if no attempt was made to increase the size on the board, then assuming correct laundering, no unshrinkable finishing would be required. But is this so? The very microscopical structure of the wool fibre reveals its tendency to felt, and excessive perspiration, which is decidedly acid in character, is bound to cause acute felting. Moreover, even if the goods are laundered with the greatest care and with the best materials, the interstices of the individual loops are bound to become closed with the repeated washings, and hence, the hygienic character of the knitted fabric is wholly or partially lost much to the detriment of the wearer and to the prestige of the knitting industry.

Hence it must be assumed that the employment of the unshrinkable process on wool underwear is a necessity, and improves the handiwork of nature in annulling or removing that part of the wool fibre, which, in the case of knitted garments, is detrimental to the wearer. .

The unshrinkable process is almost invariably done after scouring and fulling, and must be performed in wooden vats entirely free from iron fittings of any description.

To prepare the true unshrinking liquor, dissolve calcium hypochlorite in clean cold water carefully breaking up all the lumps. Stir well and allow the lime to settle. The solution should now be greenish. Skim off all the floating scum, cover the vat over and leave it to settle.

The amount of hypochlorite used may be taken approximately as 1 pound to 10 gallons of water, an amount which would be sufficient to treat 10 pounds of goods.

The preliminary acid treatment of the goods depends upon the class of yarn used in the manufacture of the goods, but for white goods a bath containing 6½ ounces of sulphuric acid in 10 gallons of water should be prepared in a wooden vat.. The liquor should, in all cases cover the goods, which should be worked for 30 minutes, turning occasionally, at a temperature of 170 degrees F. For goods

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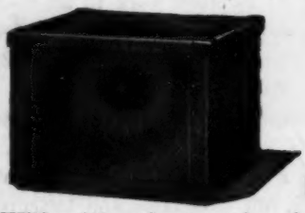

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composed of harder spun yarns the amount of acid should be reduced as well as the temperature.

For soft woolens it is often found better to use hydrochloric acid, or some form of an acid salts of which so many preparations are now on the market. After this treatment the goods are passed through squeezing rollers, the liquor being saved and used again.

Another bath of water is then prepared, sufficient to cover the goods, at 80 degrees F. To this is added the clear liquor from the chlorine vat, care being taken not to disturb the lime. The amount of the chlorine added depends on the character of the goods and the yarns used. Soft woolens like cashmeres and botanies require the least chlorine, whilst the coarse and heavy woolen goods require more.

The goods should be turned frequently and treated for about 15 minutes.

The next process is to wash the goods carefully in lukewarm water to which enough soap has been added to clear the lime. Rinse well immediately afterwards and hydro extract. Dry in good ventilation and avoid excess of heat.

Damp before pressing by using soft moist woven sheets. For delicate shades hydrochloric acid and chloride should be applied cold and the goods treated a little longer.

These general processes will be found to give satisfactory results, although as may be expected, various finishers have different methods, more especially with regard to detail.

In some cases after the goods have passed through the unshrinkable process they are subjected to a second milling for a short time at a higher temperature than the first. This is not essential but it is perhaps a necessary preventative against any excessive washing which the goods may be subjected to in the laundering. The greatest care in the unshrinking operations, however, that is required to be adopted is that with regard to the removal of the lime and other salts after the unshrinking has taken place.

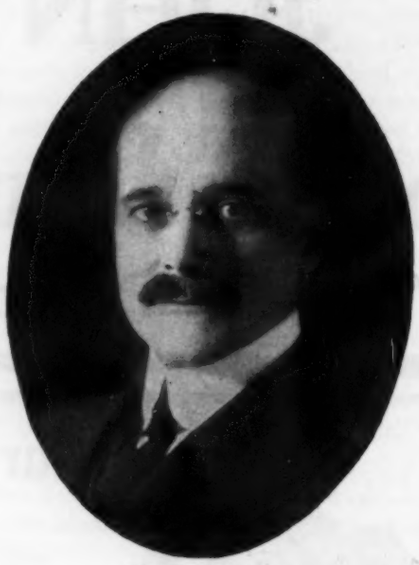
A good finisher will be able to tell by the slimy alkaline feeling of the liquor in his unshrinking vat whether the operation as proceeded as far as is advisable, for if the process is carried too far the goods will have been treated too harshly and the fibres will be permanently weakened. To avoid harshness it is advisable to add ammonia to the clearing baths, and if excess of acid has been employed, pure alkali may be beneficially added.

Many finishers still prefer to recognize the acidity or alkalinity of the bath by feel only, but the ready susceptibility of litmus paper to acids and alkalies should ensure the use of that alone in testing for acidity and alkalinity.

Excess of acid is by far the most frequent cause of harshness, although excessive treatment in the unshrinking process itself is sure to result in harsh goods.

The example of the unshrinking of woolen goods is a typical example of the benefits of the application of chemistry to industry, and providing the finisher possesses the necessary technical knowledge of the chemical actions taking place during the various processes, he is bound to succeed.

In the opinion of the writer the whole process has been conducted with too much secrecy and with not a little bluff. Mutual assistance and exchange of ideas are most essential in connection with all forms of research work, and there is little doubt that collaboration and more trade intercourse would bring to light many of the minor troubles and defects in the present unshrinkable process as practiced on knitted goods in general.—*The Hosiery Trade Journal.*



W. C. ROWLEY.

An announcement is made by the Federal Motor Truck Company confirming the election of W. C. Rowley, for some time a member of the Board of Directors, to Vice President in charge of sales succeeding J. F. Bowman resigned. Mr. Rowley assumes his new duties August 16th.

Mr. Rowley has been connected, in various capacities, with the Michigan Central Railroad for 32 years. He began his railroad career as agent for the fast freight lines of the M. C. Ten years later he became General Agent, continuing in this capacity for two years when he was advanced to Assistant General Freight Agent at Bay City. In 1903 Mr. Rowley became General Freight Agent at Detroit from which he resigned to take up his duties with the Federal Motor Truck Company.

Gasoline, George Fitch tells us, was originally used only for cleaning gloves and ejecting hired girls through the kitchen roof, but has now been taught a great variety of interesting tricks, such as running automobiles, aeroplanes, motorboats, windmills, street cars, hearses, corn shellers and bicycles.

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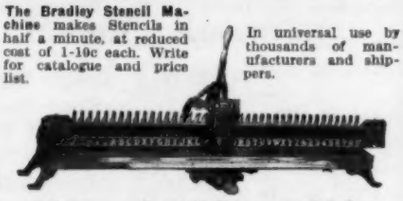

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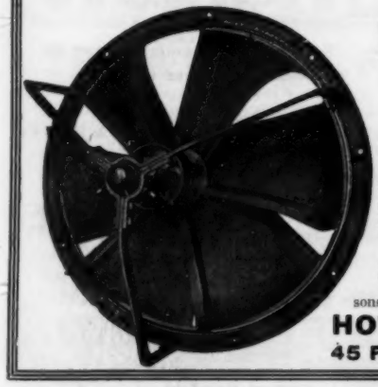

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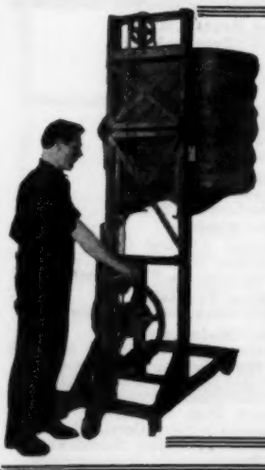

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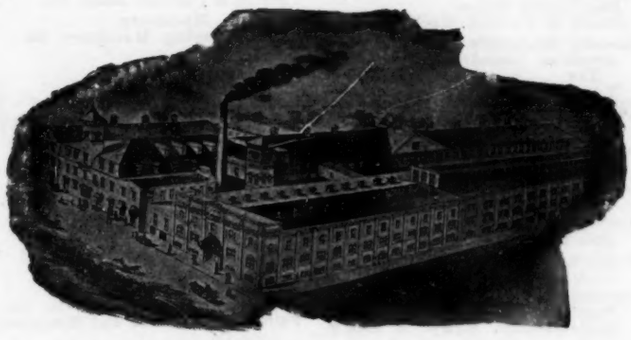

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Diamond State Fibre Co.
General Electric Co.
Western Electric Co.

Gear Cutters.
Cresson-Morris Co.
Whiton Mch. Co., D. E.

Generators (Electric).
(See Motors and Generators.)

Glass (Wire).
Mississippi Wire Glass Co.

Grain Bags.
American Supply Co.

Grates—Shaking.
Collins, J. D.
Lombard Fdy. & Mch. Co.

Grease.
(See Lubricants.)

Grease Cups.
(See Lubricators.)

Grinders—Card, Cylinder Roll, Napper and Garnett.
(See Card Grinding Machinery.)

Gummed Tape and Moistening Machine for Slasners.
Acme Gummed Products Co.

Gums.
(See Finishing and Sizing Materials.)

Hangers.
(See Shafting and Hangers.)

Harness—Loom.
American Supply Co.
Crompton & Knowles Loom Wks.
Emmons Loom Harness Co.
Garland Mfg. Co.
Loom Reed & Harness Co.

Heating and Ventilating Apparatus.
(See Ventilating Apparatus.)

Heddles.
Crompton & Knowles Loom Wks.
Draper Corporation.

Heddle Frames.
Crompton & Knowles Loom Wks.

Hoist (Electric).
Link-Belt Company.
Seeger-Walraven Co.

Hosiery Finishing Boards.
(See Boards.)

Hosiery Yarns.
(See Yarn Manufacturers.)

Hospital Equipment.
Accident Cabinet Co.
Betz, Frank S.

Hotels.
Marquette.
Martinique.
Tuller.

Humidifying Apparatus.
Carrier Eng. Corp.

Hydraulic Turbines.
(See Turbines Steam.)

Hydro Extractors.
(See Extractors.)

Hygrometers.
The Foxboro Company.

Indicating Instruments.
Taylor Instrument Co.

Indicating and Recording Instruments.
The Foxboro Company.

Indigo.
(See Dyestuffs and Chemicals.)

Injectors.
Lunkenheimer Co.

Ink (Stencil and Marking).
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.

Ink—Writing.
Baylis Office Equip. Co.

Iron Work—Ornamental.
Anchor Post Iron Works.
Dufur & Co.
Salem Iron Works.

Jacquards.
Crompton & Knowles Loom Wks.

Jute Bagging Machines.
Smith & Furbush Mach. Co.

Kettles (Size).
(See Size Kettles.)

Kettles—Soda.
Lombard Iron Works & Sup. Co.

Kiers.
(See Bleaching Kiers.)

Knit Goods.
(See Cotton Cloth Commission Merchants and Dealers.)

Knit Goods Washers.
(See Washers—Cloth.)

Knitting Machinery.
Boss Knitting Mach. Works.
Brinton Co., H.
General Machine Works.
Hemphill Mfg. Co.
Nye & Tredick Co.
Scott & Williams.
Stafford & Holt.
Smith & Furbush Mach. Co.
Wildman Mfg. Co.

Labels (Printed).
Pennebaker-Turley.

Lace Leather.
Graton & Knight Mfg. Co.

Lamps—Incandescent and Arc.
Boston Economy Lamp Div.
Carter Electric Co.
Edison Lamp Works.
General Electric Co.
Western Electric Co.
Westinghouse Electric & Mfg. Co.
Westinghouse Lamp Co.

Lappers.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.

Laundry Machinery.
American Laundry Mach. Co., The
Tolhurst Machine Works.

Leather Belting.
(See Belting—Leather.)

Linen Yarns.
(See Yarns—Linen.)

Link Belting.
(See Belting—Link.)

Liquid Chlorine.
(See Chlorine.)

Loaders (Wagon and Truck).
Link-Belt Company.

Lockers (Metal)
Baylis Office Equipment Co.
Manufacturers Equip. & Eng'g Co.

Logwood Extract.
(See Dyestuffs and Chemicals.)

Looms.
Crompton & Knowles Loom Wks.
Draper Corporation.
Saco-Lowell Shops.
Schofield, Wm. & Co.
Stafford Co., The

Loom Harness Straps.
Graton & Knight Mfg. Co.

Lubricants.
Dixon, Jos., Crucible Co.
Kellogg & Co., E. H.

Lubricators.
Lunkenheimer Co.

Lug Straps.
(See Straps—Lug.)

Lumber.
Salkeld, A. D & Bro.

Marking Pots, Stencils, Ink, Etc.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.

Measuring Machine (Cloth).
Windle, J. E.

Mercerized Yarns.
(See Yarns Mercerized.)

Mercerizers.
Aberfoyle Mfg. Co.
Home Bleach & Dye Works.
Peech, Sons & Phillips Co.

Mercerizing Machinery.
Butterworth, H. W. & Sons Co.
Smith, Drum & Co.
Textile Finishing Machinery Co.
Wolf & Co., Jacques.

Metal Ceilings, Etc.
Canton Metal Ceiling Co.
General Fireproofing Co.

Meters (Revolution).
The Foxboro Co.

Meters (Flow, Air, Gas, Electric, Steam, Etc.)
Allis-Chalmers Mfg. Co.
Carter Electric Co.
The Foxboro Co.
General Electric Co.
Lincoln Electric Co.
Western Electric Co.
Westinghouse Elec. & Mfg. Co.

Mill Baskets and Boxes.
(See Boxes—Mill.)

Mill Engineer.
(See Architects and Engineers).

Mill White Paint.
(See Paint—Mill White.)

Motors and Generators (Electric).
Allis-Chalmers Mfg. Co.
Carter Electric Co.
General Electric Co
Lincoln Electric Co.
Seeger-Walraven Co.
Western Electric Co.
Westinghouse Elec. & Mfg. Co.

Mule Stands.
Transmission Ball Bearing Co.

Napper Grinders.
Roy & Son, B. S.

Napping Machinery.
Leigh & Butler.

Office Supplies, Furniture, Etc.
Baylis Office Equip. Co.
General Fireproofing Co.

Oils—Finishing.
(See Finishing and Sizing Materials.)

Oils—Lubricating.
(See Lubricants.)

Oil Cups.
(See Lubricators).

Oil Paper.
Bradley Mfg. Co., A. J.

Oiling Devices.
(See Lubricators).

Openers for Cotton, Wool, Waste Etc.
Leigh & Butler.
Saco-Lowell Shops.
Schofield Co., Wm.
Smith & Furbush Mach. Co.

Oxidizing Machinery.
Phila. Drying Machinery Co.

Oxygen.
Bird Wilcox Co.
Burdett Oxygen Co.
Davis-Bournonville Co.
Prest-O-Lite Co.

Packings—Leather.
Graton & Knight Mfg. Co.

Paint.
Arco Co.
Barrett Co., The.
Certain-teed Products Corp.
Chaffee, Thos. K.
General Fireproofing Co.
Peaslee-Gaulbert Co.
Ullman-Philpott Co.
Wadsworth-Howland & Co., Inc.

Paint—Preservative and Fireproof.
Arco Co.
Certain-teed Products Corp.
General Fireproofing Co.
Peaslee-Gaulbert Co.
Wadsworth-Howland & Co., Inc.

Paint—Mill White.
Arco Co.
Chaffee, Thos. K.
General Fireproofing Co.
Peaslee-Gaulbert Co.
Ullman-Philpott Co.
Wadsworth-Howland & Co., Inc.

Paper (Oil).
Bradley Mfg. Co., A. J.

Perforated Metal.
(See Screens and Sieves.)

Photographer of Mills.
Shutting Co., Rudolph J.

Picking Machinery.
Howard & Bullough, Am. Machine Co.
Saco-Lowell Shops.
Schofield Co., Wm.
Smith & Furbush Mach. Co.

Pickers—Curled Hair.
Schofield, Wm. Co.
Smith & Furbush Mach. Co.

Picker Housings.
Hubbard Mch. Co.

Pickers—Leather.
Garland Mfg. Co.
Graton & Knight Mfg. Co.

Picker Sticks.
Garland Mfg. Co.

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Lunkenheimer Co.

Pipe Threading & Cutting Machines
Seeger-Walraven Co.

Power Companies.
(See Central Stations.)

Power Transmission.
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Arguto Oilless Bearing Co.
Bound Brook Oil-less Bearing Co.
Caldwell Co., W. E.
Cork Insert Co.
Cresson-Morris Co.
Fraedrich Belting Co.
General Electric Co
Graton & Knight Mfg Co.
Link-Belt Company.
Seeger-Walraven Co.
S K F Ball Bearing Co.
Textile Specialty Co.
Transmission Ball Bearing Co.
Western Electric Co.
Westinghouse Electric & Mfg. Co.

Press Papers.
Diamond State Fibre Co.
Phila. Drying Machinery Co.

Presses.
American Laundry Mchy. Co. The
Butterworth & Sons Co., H. W.
Economy Baler Co.
Phila. Drying Machinery Co.
Reliance Machine Works.
Seeger-Walraven Co.
Smith, Drum & Co.
Smith & Furbush Mch. Co.
Textile Finishing Machinery Co. The

Printed Forms, Time Books, Bands, Labels, Tickets, Etc.
Pennebaker-Turley.

Publishers.
Literary Digest.
Davison Pub. Co.

Pulleys.
Caldwell Co., W. E.
Cork Insert Co.
Cresson-Morris Co.
Link-Belt Company.
Seeger-Walraven Co.
Transmission Ball Bearing Co.

Pulleys (Cork Insert).
Cork Insert Co.

Pulley Covering.
Fraederich Belting Co.
Graton & Knight Mfg. Co.

Pumps.
Allis-Chalmers Mfg. Co.
Collins, J. D.
Reilly Mfg. Co., J. J.
Seeger-Walraven Co.
Textile Finishing Machinery Co., The
Toomey, Frank.
Walsh & Weidner Boiler Co.
Westinghouse Elec. & Mfg. Co.

Pyrometers.
Taylor Instrument Co.

Racks—Metal.
Manufacturers Equip. & Eng. Co.

Railings.
Dufur & Co.

Railways—Industrial.
(See Trucks—Electric.)

Railways.
Central of Ga. Railway.
Southern Railway.

Recording Instruments.
Taylor Instrument Co.
The Foxboro Company.

Reeds.
American Supply Co.
Emmons Loom Harness Co.
Loom Reed & Harness Co.

Reels.
Crompton & Knowles Loom Wks.
Draper Corporation.
Saco-Lowell Shops.
Schofield Co., Wm.

Regulators (Pressure).
Taylor Instrument Co.

Regulators (Temperature).
Taylor Instrument Co.

Reinforcement (Steel).
General Fireproofing Co.

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Hubbard Mch. Co.

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Windle, J. E.

Rib Top Cutters.
General Machine Works.
Wildman Mfg. Co.

Ring Travelers—Steel and Bronze.
Whitinsville Spinning Ring Co.

Rings—Spinning.
(See Spinning Rings.)

Rocker Shaft Bearings.
(See Bearings.)

Rolls—Steel.
Southern Spindle & Flyer Co.

Roller Covering.
Graton & Knight Mfg. Co.

Roofing.
Barrett Co., The.
Certain-teed Products Corp.
Cortright Metal Roofing Co.
General Fireproofing Co.

Roof and Cement Coating.
Certain-teed Products Corp.
General Fireproofing Co.
Peaslee-Gaulbert Co.
Wadsworth, Howland & Co., Inc.

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Caldwell Co., W. E.

Rope—Transmission.
Caldwell Co., W. E.
Cresson-Morris Co.
Hunt Co., C. W., Inc.
Link-Belt Company.

Roving Cans & Trucks.
(See Cans—Roving.)

Roving Machinery.
Howard & Bullough.
Saco-Lowell Shops.

Rubber Stamps.
(See Stamps, Stencils, Etc.)

Saddles and Stirrups.
Dixon Lab. Saddle Co.

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Bound Brook Oil-less Bearing Co.

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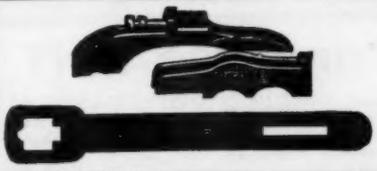

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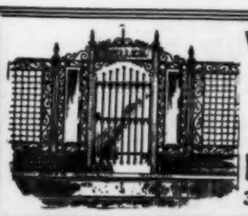

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Seeger-Walraven Co.
Toomey, Frank.

Sewing Machines.
Merrow Machine Co., The.
Textile Finishing Mchy. Co.
Willcox & Gibbs Sewing Mch. Co.

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Cresson-Morris Co.
S K F Ball Bearing Co.
Seeger-Walraven Co.
Transmission Ball Bearing Co.

Shafting Rings.
Graton & Knight Mfg. Co.

Shelving—Sectional Steel.
Canton Metal Ceiling Co.
General Fireproofing Co.
Lupton's Sons Co., David.
National Scale Co.

Shingles (Asphalt).
Certain-teed Products Corp.

Shingles—Metal.
Canton Metal Ceiling Co.
Cortright Metal Roofing Co.

Shuttles.
Crompton & Knowles Loom Wks
Draper Corporation.
Shambow Shuttle Co.

Singeing Machinery.
Butterworth & Sons Co., H. W
Phila. Drying Machinery Co.
Smith, Drum & Co.
Textile Finishing Machinery Co., The.

Size Kettles.
Allen Sons Co., Wm.
Butterworth, H. W. & Sons Co.
Howard & Bullough, American Machine Co.
Lombard Iron Works & Sup. Co.
Saco-Lowell Shops.
Textile Finishing Machinery Co., The.
Worcester Steam Boiler Wks.

Sizing and Finishing Compounds.
(See Finishing & Sizing Materials.)

Size System.
Keever Starch Co.
Seydel Mfg. Co.
Wolf & Co., Jacques.

Skewers.
Jordan Mfg. Co.

Skylights—Steel.
Lupton's Sons, Co., David.

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Freadrich Belting Co.

Slag.
Birmingham Slag Co.

Slashers.
Butterworth & Sons Co., H. W.
Cocker Mch. & Foundry Co.
Howard & Bullough.
Saco-Lowell Shops.
Salem Iron Works.
Textile Finishing Machinery Co., The.

Slasher Tape—Gummed.
Acme Gummed Products Co.

Slate Asphalt Roofing.
Certain-teed Products Corp.

Slubbers.
Howard & Bullough.
Saco-Lowell Shops.

Soaps.
American Soap & Washoline Co.
Baltic Chemical Co.
Brown & Bro., B.
Electric Smelting & Aluminum Co.
Jordan Jr., W. A. & F.
Madero Bros.
Marden, Orth & Hastings Corp.
Miller, Jos. B.
Warren Soap & Mfg. Co.

Soda (Textile).
American Soap & Washoline Co.
Baltic Chemical Co.
Brown & Bro., B.
Cone, Frederick H.
Grasselli Chemical Co.
Jordan, Jr., W. H. & F.
Madero Bros.
Marden, Orth & Hastings Corp.
Miller, Jos. B.

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Arabol Mfg. Co.
Baltic Chemical Co
Bosson & Lane
Brown & Bro., B.
Grasselli Chemical Co.
Jordan, Jr., W. H. & F.
Kali Mfg. Co.
Madero Bros.
Marden, Orth & Hastings Corp.
Miller, Jos. B.
Seydel Mfg. Co.
Wolf & Co., Jacques.

Softeners—Water.
(See Water Softeners.)

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Saco-Lowell Shops.
Southern Spindle & Flyer Co.

Spindles—Ball Bearing.
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Draper Corporation.
Howard & Bullough.
Saco-Lowell Shops.
Smith & Furbush Machine Co.

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Parkdale Mills, Inc.

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Howard & Bullough.
Whitinsville Spinning Ring Co.

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Draper Corporation.
Saco-Lowell Shops.
Smith & Furbush Machine Co.

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(See Tanks, Towers, Etc.)

Sprocket Wheels.
Link-Belt Company.

Stamps, Stencils and Stencil Machines.
Atlanta Stamp & Stencil Works.
Bradley Mfg. Co., A. J.

Stand Pipes.
(See Tanks, Towers, Etc.)

Starch & Gums.
(See Finishing and Sizing Materials.)

Steam Engines.
(See Engines—Steam.)

Steam Hose.
(See Hose—Steam.)

Steam Pumps.
(See Pumps—Steam.)

Steam Traps.
(See Traps—Steam.)

Steel Coatings.
General Fireproofing Co.

Steel Doors, Windows, Partition, Etc.
General Fireproofing Co.
Lupton's Sons Co., David.

Stencils & Stencil Papers.
(See Stamps and Stencils.

Stencil Brushes.
(See Marking Pots and Brushes.)

Stencil Machines.
(See Stamps and Stencils.)

Stop Motion.
Crompton & Knowles Loom Wks.
Draper Corporation,
Wildman Mfg. Co.

Straps—(Lug).
Freadrich Belting Co.
Graton & Knight Mfg. Co.

Tachometers.
The Foxboro Company.
Veeder Mfg. Co.

Tallow.
(See Finishing Material.)

Tanks, Towers and Tubs.
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American Textile Banding Co., Inc.
Barber Mfg. Co.
Weimar Brothers.

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National Scale Co.

Temples.
Draper Corporation.

Tenters.
Butterworth & Sons Co., The.
Textile Finishing Mach. Co.

Thermometers (All kinds).
Taylor Instrument Co.

Thermometers (Wet and Dry Bulb).
The Foxboro Company.

Thin Place Preventers.
Draper Corporation.

Thread Guides.
Palmer Co., The I. E.

Tiering Machines.
Collins, J. D.

Time Recorders.
Howard Time Recording Co.

Toilets.
Cement Products Co.
Kaustine Co., Inc.
Selig Co., The
Vogel Co., Jos. A.

Towers.
(See Tanks and Towers.)

Transmission (Power).
(See Power Transmission Machinery.)

Traps (Return Steam).
Morehead Mfg. Co.

Trucks—Auto.
Federal Motor Truck Co.
White Co., The

Trucks—Electric—Inter.
Automatic Transportation Co.
Hunt Co., C. W.

Trucks—Elevating—Inter.
Cowan Truck Co.
Hunt Co., C. W.
National Scale Co.

Trucks—Fibre (Inter, Etc.).
American Vulcanized Fibre Co.
Diamond State Fibre Co.
Fibre Specialty Co.
Keystone Fibre Co.
Lane & Bro., W. T.
Leatheroid Mfg. Co.
Spaulding & Sons, J.
Standard Fibre Co.

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Southern Novelty Co.

Turbines (Steam).
Allis-Chalmers Mfg. Co.
General Electric Co.
Seeger-Walraven Co.
Western Electric Co.
Westinghouse Elect. & Mfg. Co.

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Draper Corporation.
Howard & Bullough.
Leigh & Butler.
Saco-Lowell Shops.
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Foster Engineering Co.
Lunkenheimer Co.

Valves (Non-return Stop).
Foster Engineering Co.
Lunkenheimer Co.

Valves (Pop-Safety).
Foster Engineering Co.
Lunkenheimer Co.

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Arco Co.
General Fireproofing Co.
Peaslee-Gaulbert Co.
Ullman-Philpott Co.
Wadsworth, Howland & Co.

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Carrier Eng. Corp.
General Electric Co.
Howard & Morse.
New York Blower Co.
Sargent's Sons Co., C. G.
Tolhurst Mch. Co.
Western Electric Co.

Warp Tying Machines.
Barber-Colman Co.

Warpers and Warping Machinery.
Cocker Machine & Fdry Co.
Crompton & Knowles Loom Wks.
Draper Corporation.
Howard & Bullough.
Saco-Lowell Shops.
Salem Iron Works.
Smith & Furbush Mach. Co.

Washers (Cloth).
American Laundry Machinery Co. The
Butterworth, H. W & Sons Co.
Cocker Mch. & Foundry Co.
Philadelphia Drying Mchy. Co.
Phila. Textile Mchry. Co.
Salem Iron Works.
Textile Finishing Mchry Co.

Washers, Graphite and Bronze.
Bound Brook Oil-less Bearing Co.

Washers, Leather.
Graton & Knight Mfg. Co.

Washers, Wooden, Oil-less.
Bound-Brook Oil-less Bearing Co.

Waste (Purchasers of).
Valley Waste Mills.

Waste Machinery (Cotton).
Howard & Bullough.
Leigh & Butler.
Saco-Lowell Shops.
Sargent's Sons Co., C. G.
Schofield Co., Wm.
Smith & Furbush Mach. Co.

Water Columns.
Lunkenheimer Co.

Water Coolers (Drinking).
(See Fountains—Drinking.)

Water Cooling Ponds.
(See Cooling.)

Water Softeners.
Refinite Co.
Scaife & Sons Co., Wm. B.

Waterproofing Machinery.
Butterworth, H. W. & Sons Co.
Textile Finishing Machinery Co. The

Weaving.
(See Yarn Manufacturers.)

Welding Apparatus (Electric Arc.)
Lincoln Electric Co.
Westinghouse Elec. & Mfg. Co.

Welding Apparatus (Oxy-acetylene)
Bird-Wilcox Co., Inc.
Burdett Oxygen Co.
Davis-Bournonville Co.
Prest-O-Lite Co.

Welding—Job.
Bird-Wilcox Co., Inc.

Wheels—Fibre.
American Vulcanized Fibre Co.
Diamond States Fibre Co.
Fibre Specialty Co.
Keystone Fibre Co.
Leatheroid Mfg. Co.
Spaulding & Sons, J.
Standard Fibre Co.

Whistles (Steam).
Lunkenheimer Co.

Winding.
Aberfoyle Mfg. Co.
Home Bleach & Dye Works.

Winders.
Crompton & Knowles Loom Wks.
Firsching, J. A.
Howard & Bullough, American Machine Co.
Leigh & Butler.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Stafford Co., The
Windle, J. E.

Windows—Steel.
Lupton's Sons Co., David.

Wire Glass.
(See Glass—Wire.)

Wiring (Electrical).
(See Electrical Contractors).

Wood Preserver.
Arco Co.
Certain-teed Products Corp.
General Fireproofing Co.
Peaslee-Gaulbert Co.
Wadsworth Howland & Co., Inc.

Wood Pulleys.
Cresson-Morris Co.

Woolen Machinery.
Butterworth, H. W. & Sons Co.
Crompton & Knowles Loom Wks.
Draper Corporation.
Leigh & Butler.
Schofield Co., Wm.
Phila. Drying Machinery Co
Phila. Textile Machinery Co.
Sargent' Sons Corp., C. G.
Stafford Co., The
Smith & Furbush Mach. Co.
Textile Finishing Machinery Co. The

Yarn Manufacturers.
Aberfoyle Mfg. Co.
Gray Mfg. Co.
Parkdale Mills, Inc.
Peech Sons & Phillips Co.

Yarns (Mercerized).
Peech Sons & Phillips Co.

Yarn Dealers and Commission Merchants).
(See Cotton Cloth Commission Merchants and Dealers.)

SEYDEL MANUFACTURING COMPANY
JERSEY CITY N. J.

SIZOL

Makes the Strongest, Smoothest Warps; the Best Cloth and Least Seconds.

Southern Representatives:
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Established 1906.

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Phone Ivy 4857. GEORGIA.

Make a specialty of Mill Auditing and Systematizing. Over ten years practical experience. Write, wire or phone.

J. E. SIRRINE,

Mill Architect and Engineer

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Textile Mills and Water Power Developments

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CHICAGO—Marquette Building.
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NEW ORLEANS—Maison Blanche.
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Specialists in Cost Systems and Manufacturing Accounts.

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ADVERTISING is an economy and cuts the cost of selling, making lower prices or better goods possible without sacrifice of the producers' profits.

PERFORATED METALS

FOR ALL PURPOSES

Such as Cotton Seed Oil Mills, Cotton Gins, Phosphate Screens, Coal Screens, Ventilation, Electrical Devices, Sugar Mills, Surfacing for Sand Rolls.

Send for Metal Sample Plate and Circular.

ERDLE PERFORATING CO.

163 YORK ST., ROCHESTER, N. Y.

Classified Opportunities.

Positions Open.

WANTED—Competent fixer on Scott & Williams machines. Good wages to the right man. Write sending references. Box No. 100, care "Cotton."

WANTED—A first-class Carding Overseer who is competent to handle waste work on woolen system cards. This is a good room and a good job, located in a good section of a Southern State. Position must be filled immediately, therefore a prompt reply is necessary. Address Box 369, care COTTON.

Positions Wanted.

POSITION WANTED—As Superintendent by young man 29 years old and married. Has had 7 years experience in practical mill work as overseer of carding a large part of the time. Has also had charge of a combing department. Is familiar with the manufacture of combed yarns, both fine and coarse, and all American makes of machinery, as well as some foreign. Is now employed, but desires to change to secure improved position. Is a textile graduate of a Southern textile school, and is familiar with designing and fancy weaving. Address Box 367, care COTTON.

POSITION WANTED—As overseer of Spinning or Twisting, by a man with 13 years' experience in cotton mills, 9 years as overseer of spinning. Is 37 years old and married. Experience has been all on heavy yarns for the manufacture of heavy ducks. Familiar with Saco-Lowell and Howard & Bullough machinery. Is at present employed, but would be interested in a better position and could accept it on 10 days notice. Does not care to go outside of Georgia. Address Box 368, care COTTON.

POSITION WANTED as superintendent or manager. A man with wide experience, over 20 years in many large Northern mills, desires position, preferably in the South. Experienced on all kinds of plain and fancy goods, cotton, silk, linen, and some wool. Have acted as purchasing agent for a number of concerns and have taken charge of the erection and organization of mills for both fine and coarse yarns, combed and carded. Capable of doing designing where necessary. Familiar with all kinds of machinery and power plants. Very best of references exchanged. Address Box 312, care COTTON.

POSITION WANTED by Georgia mill man as superintendent. Have had 17 years experience on white and colored goods and all kinds of textile machinery. Now employed but desire to change to position where there is chance for promotion. References from several well known mill men. Age 35 and married. Address Box 93, care COTTON.

POSITION WANTED as Overseer of Spinning or Twisting, in some Georgia mill. Have had 13 years experience on all heavy duck, and with Saco-Lowell, H. & B. and other machinery. Good references. Married and 37 years of age. Address Box 97, care COTTON.

RATES:

WITHOUT DISPLAY.

"Positions Wanted" 3 cents per word per insertion. Minimum charge 50 cents. Payable in advance.

"Positions Open" and other undisplayed advertisements, 4 cents per word per insertion. Minimum charge $1.00. Payable in advance.

(When replies are to be received in our care, allow four words for box address.)

DISPLAYED.

"For Sale" and all other advertisements using bold-face type or otherwise displayed, $2.00 per inch per insertion.

Rates for larger spaces furnished on application.

For Sale.

For Sale

Three model 6, 100 spindle Foster Winders, second hand, but now in use and can be seen running. Do good work on numbers 4's to 14's. Reason for wishing to sell, going on to finer numbers. Tubing spindles can be attached. Will sell cheap and give early delivery. Address, Kinston Cotton Mills, Kinston, North Carolina.

FOR SALE

Southern Hosiery Mill

80 Knitting Machines and Dye Plant. Electric Drive. Running full capacity.

Owner retiring from business and will sell cheap and on reasonable terms.

Address

J. H. Maddox

314 Candler Bldg. Atlanta, Ga.

WANTED
Children's Hosiery.

An inquiry has been received for 1.000 cases of children's ribbed hose in sizes 5 to 10, at a price of 85 cents to 87½ cents a dozen. Any mill in a position to consider a proposition of this character should communicate with Box 28, care COTTON.

Used Machines For Sale

F. O. B. Atlanta

One 20" x 12' Lathe.
One 32" x 12' Lathe.
Two 16" x 10' Lathe.
One 16" x 8' Lathe.
One 24" Aurora Drill Press with tapping attachment.
One new 1½" Single Head Landis Bolt Cutter.
New Marvel Power Hack Saws in stock for immediate delivery.
We can equip you in either new or used machinery. Write us.

Seeger-Walraven Company
Machinery and Mill Supplies.
38 W. Alabama St., Atlanta, Ga.

New and Second Hand

ENGINES

Corliss Automatic and Slide Valve

BOILERS

Pumps, Hoisting Engines, Gas and Gasoline Engines.

MACHINE TOOLS

Lathes, Planers, Shapers, Drill Presses, etc.

WOOD WORKING

Planers, Molders, Band Saws, etc.

ELEC. MACHINERY

Dynamos and Motors

AND SUPPLIES OF ALL KINDS

FRANK TOOMEY, Inc.,

127-31 N. Third St.

Philadelphia, - Pennsylvania

Mr. Glancy
of
The MARQUETTE
18th St. and Washington Ave.
St. Louis

A Refined Hotel for Your Mother, Wife and Sister

Rates:
Room with Private Bath
One Person
$1.50, $2.00, $2.50, $3.00
Two Persons:
$2.50, $3.00, $3.50, $4.00
Rooms without bath, $1 and $1.50

Proper Locations for Cotton Mills

United States Census figures show that since 1880 the consumption of cotton in mills of the cotton growing states has increased 1,502 per cent, as compared with an increase of only 93 per cent in all other states. In the twelve months ended August 31, 1916, Southern mills consumed 675,731 more bales of cotton than the mills of all other states. Three-fourths, or 10,000,000, of the total cotton spindles in the cotton growing States are served by the Southern Railway System. Of the 200 knitting mills in the South over 125 are located along the Southern Railway System. Nearly all the Southern woolen and silk mills are also on Southern Railway System tracks.

There is a reason for this, and it is not difficult to understand.

The Southern Railway System lines enter and serve most completely those portions of the South where the textile industry is the greatest success, because there are found all the conditions which make for successful manufacture—the proper transportation facilities, the ease with which the raw materials and the needed fuel may be secured, the supply of good labor, the pure water, the low cost of power, and favorable local conditions.

Not only for textile plants but for all other industries the best advantages will be found in this territory.

If you have a plant to locate let us take up with you the question of the proper location. Your plans will be held confidential. Our knowledge of conditions at various points and our experience in locating other mills and the time of our agents in making special investigations are at your service, if desired.

M. V. RICHARDS
COMMISSIONER
Room 131
SOUTHERN RAILWAY SYSTEM
Washington, D. C.

Meet me at the Tuller for Value, Service, Home Comfort

***New* HOTEL TULLER**

Detroit, Michigan.

Center of business on Grand Circus Park. Take Woodward car, get off at Adams Avenue.

ABSOLUTELY FIREPROOF

200	Rooms,	Private	Bath,	$1.50	Single,	$3.00	up double
200	"	"	"	2.00	"	4.00	" "
100	"	"	"	2.50	"	4.50	" "
100	"	"	"	3.50 to 5.00	"	5.00	" "

Total 600 Outside Rooms.

ALL ABSOLUTELY QUIET

Two Floors—Agents' Sample Rooms

New Unique Cafes and Cabaret Excellente

The House of Taylor

400 Baths
600 Rooms

HOTEL MARTINIQUE

Broadway, 32d St., New York

One Block from Pennsylvania Station.
Equally Convenient for Amusements, Shopping or Business.

157 Pleasant Rooms, with Private Bath,
$2.50 PER DAY

257 Excellent Rooms, with Private Bath, facing street, southern exposure,
$3.00 PER DAY

Also Attractive Rooms from $1.50.

The Restaurant Prices are Most Moderate.

Equip Your Villages With Kaustine Waterless Toilets

Do away with unsanitary outhouses. They cause sickness among your employees. They breed disease. They promote lax personal habits and foster inefficiency.

Save yourself the high installation costs of Water Closet systems and save yourself the huge upkeep expenses consequent thereto.

KAUSTINE
Waterless Toilet Systems

are absolutely sanitary and are recommended by health authorities everywhere. They can be installed in any building easily, reasonably and successfully.

No water or sewer connections are required. Each system, whether it be single or multiple, is complete in itself. There is nothing to get out of order. No water pipes to freeze—no drains to clog.

Kaustine Systems are made in styles to comply with the requirements of practically all types of buildings —homes, mills, schools, churches, hotels, etc.

Consult Our
Engineering Department

Put your problems up to them and receive without the incurrence of any obligation the full facts regarding what Kaustinizing will do for you.

WRITE FOR KAUSTINE CATALOG.

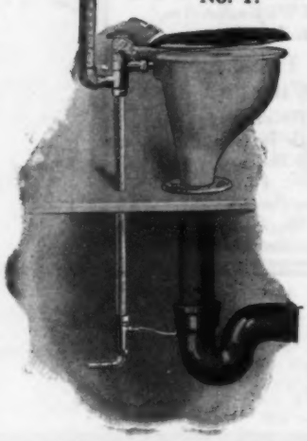
Kaustine Company, Inc.
GREENVILLE, SOUTH CAROLINA.

Three Methods of Installing Kaustine Systems.

VOGEL
PATENTED

Frost Proof Closets

Quarter of a Million giving satisfaction. Save Water; Require No Pit; Simple in the extreme. The most durable water closet made. In service winter and summer.



No. 1.

Enameled roll flushing rim bowls.

Heavy brass valves.

Strong hardwood seat.

Galvanized tank.

Malleable seat castings will not break.

Tested under hydraulic pressure before leaving factory.

SOLD BY JOBBERS EVERYWHERE.

JOSEPH A. VOGEL CO.
WILMINGTON, DELAWARE

ADVERTISERS

Are almost invariably the most successful business men in their industry, and success in business is inseparable from service rendered.

THIS BY ITSELF MAKES ANY OLD PRIVY FLY-PROOF AND SANITARY

No need for screens or "vaulting in" to make flyproof—No need for running water, plumbing, high priced fixtures or expert labor to install the

STEVENS SANITARY CLOSET CAN

AND IT GIVES YOU ALL YOU NEED IN A SURFACE CLOSET FOR LEAST COST

Metal construction—can't rot, go to staves, leak, crack, burst from freezing, or clog. Can be depended upon through heat, cold, rains or drouth. Is instantly installed and quickly removable for cleaning. Instantly replaced in exact position under seat, without the use of hooks, locks or vents to get damaged or require attention.

Extra deep upright receptacle makes it superior to shallow can or conical containers with slanting sides, and prevents contents from splashing out when removed for cleaning.

Patented sliding collar holds receptacle in position, catches all excreta, prevents soil and water pollution. Shows at a glance when can is properly replaced and fly proof.

GIVES ALL THE PRIVACY OF THE SEWERED CLOSET FOR ONLY $3.00

Don't be deprived of an adequate toilet system,—don't squander time and money in high sounding. complicated, expensive systems and devices to improve your sanitary conditions.

INVEST TODAY IN STEVENS CANS

the efficient, the practical, the best by test, most economical device for the purpose on the market at anywhere near its price or ask for full information.

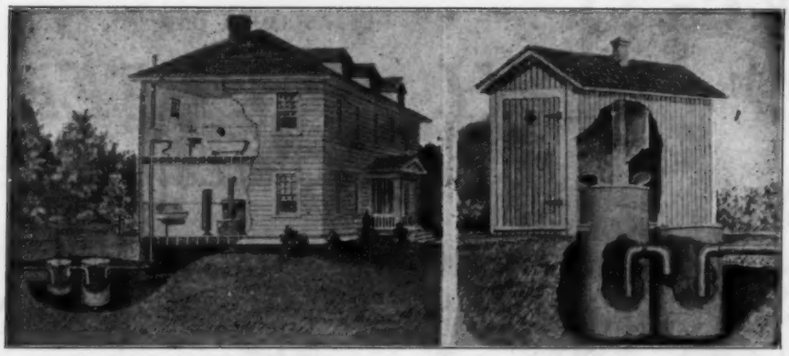
Write TODAY.

THE SELIG CO.,

Manufacturers **ATLANTA, GA.**

THE SELIG COMPANY OF TEXAS
Western Distributors

DISINFECTANTS AND SANITARY PRODUCTS
DALLAS, TEXAS



No. 1, 'SANISEP" System for use with running water.

No. 2, "SANISEP" System for two families. No running water required.

Patented

"SANISEP" Portable Sewerage Systems

(Trade Mark Reg.)

THE perfect System for Mill villages, suburban homes, and schools with or without running water. Made of reinforced concrete with solid bottoms and thoroughly waterproofed. All scavenger work done away with, no chemicals required, flyproof and odorless.

ENDORSED BY ALL HEALTH AUTHORITIES

Write for Catalogue

CEMENT PRODUCTS COMPANY

WILMINGTON, N. C.

East Point, Atlanta, Ga. | Union Trust Bldg., Charleston, W. Va. | 328 Chestnut St., Philadelphia | Oliver Bldg., Pittsburgh, Pa.

Commission Merchants, Yarn Dealers, Cotton Dealers and Brokers, Etc.

Weimar Bros.

Phone Connections
Works, 2046-48 Amber Street,
PHILADELPHIA, PA.

MANUFACTURERS OF
Cotton Mercerized Tapes, Spool Tapes, Bindings and Narrow Fabrics for Underwear and other Trades.

A. D. Salkeld & Bro.
COMMISSION MERCHANTS
COTTON AND WORSTED YARNS
366 BROADWAY Cor. Franklin St. NEW YORK
DEPT. FRED'K VIETOR & ACHELIS.

WOODWARD, BALDWIN & CO
DRY GOODS
COMMISSION MERCHANTS
43-45 WORTH STREET, NEW YORK

HAVE THAT SAFE FEELING
When buying products advertised in COTTON you can always have that safe feeling that each advertiser is reliable and lives up to the claims made in his advertisement.

PAULSON, LINKROUM & CO.
COMMISSION MERCHANTS
COTTON YARNS
PHILADELPHIA NEW YORK CHICAGO

Amory, Browne & Co.
Boston New York

SELLING AGENTS FOR

Nashau Manufacturing Company
Indian Head Mills Alabama
Samuel A. Crozier & Son
Lancaster Mills
Jackson Company
Parkhill Manufacturing Company
Wauregan Company
Lowe Manufacturing Co.
Quinebaug Company

B. B. & R. Knight (Export only)

ESTABLISHED 1872

H. & B. BEER
NEW ORLEANS

HENRY BEER EDGAR H. BRIGHT
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MEMBERS OF
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Associate Members of the Liverpool Cotton Association

Private Wires to Principal Points

HUGHES FAWCETT
IMPORTER AND COMMISSION MERCHANT
LINEN YARNS
For Weaving, Knitting and all Purposes
TURKEY RED YARNS
For Towel Borders, Towellings and Bleaching Cloth
Linen Jacquard Harness Twine
And Every Description of Linen Thread and Twine
115 Franklin Street, : NEW YORK

UNIFORM YARNS

Careful buyers always demand that the yarn they buy run uniformly. This is essential to profitable production, as it means uniform goods.

"Gray-Dawn" Quality Yarn

has established an enviable reputation for itself among the most careful buyers because of its absolute uniformity throughout. "Gray-Dawn" is made from the strongest and most uniform staple, carefully selected from the best combed peeler cotton that money can buy.

Gray Manufacturing Co.

Gastonia, - - North Carolina

131 East 23rd Street, New York City.

DON'T CUT COSTS

by sacrificing the quality of your goods. It's always folly.

The best way to cut costs is by using the best yarns that you can buy.

"Parkdale" Fine C. P. Yarn

is dependable combed peeler reversed yarn that is made to a standard, always the same, uniform, clear and even. It is made from the best fine combed peeler cotton that we can purchase, and the best methods of production used in its manufacture. All counts and varieties for every purpose.

Parkdale Mills, Inc.

Gastonia, - - North Carolina

131 E. 23rd St., New York City.

Mercerized Yarns

Prepared Specially for the

Hosiery Trade

Peech Sons & Phillips Co.,

Camden, N. J.

Influencing One Man

In every sale there is one man who has to be convinced.

In the biggest, as in the smallest propositions, a single intelligence makes the final decision.

It is the kind of intelligence that forces its way to the top by knowing the value of exact information and how to make it work.

You can't always know where this one man is, nor who he is.

The Digest seeks him out for you.

Maybe he has an open mind but he never heard about your product. He doesn't know what it can do for him.

Maybe he isn't at all receptive.

Then only by iteration and reiteration can you influence him.

Your message in The Digest goes to the one man and to his associates who depend upon The Digest to give them news of the forces that are changing our daily business and our daily life.

It goes to the banker from whom the executive borrows money.

It goes to the technical man—one out of three of all the engineers in the country is a Digest subscriber.

There is no publication more effective than The Digest in influencing the one man who decides.

IMMEDIATE National Publicity

The Literary Digest

New York

Starch

Eagle Finishing

400 MILL
C. P. SPECIAL

500 MILL
FAMOUS N.

BLUE RIVER CRYSTAL

These STARCHES are manufactured by carefully controlled and standardized methods.

PURITY and UNIFORMITY are secured by accurate laboratory tests.

ECONOMY and EFFICIENCY are proven by the constantly increasing number of exacting cotton manufacturers who are getting satisfactory results by using our STARCHES especially selected for their conditions.

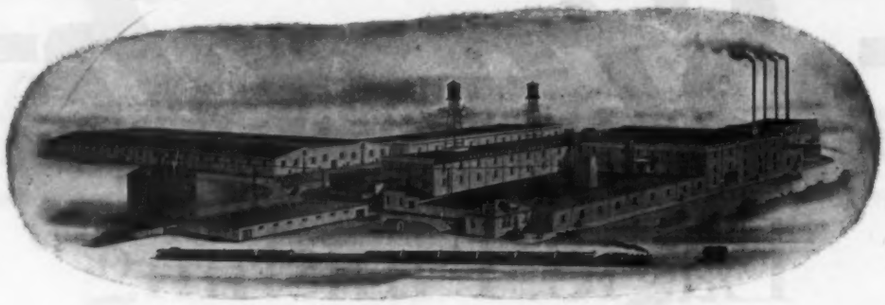
Recommendations are based upon intelligent investigation of each individual problem.

Corn Products Refining Co.

New York

Southern Office *Greenville, S. C.*

Starch



VICTOR MILL STARCH

The Weaver's Friend

It boils thin—penetrates the warps—increases breaking strength and carries the weight into the cloth. Being thoroughly washed free of gluten and other foreign matter it gives a bleach and finish to the goods that you can get from no other starch.

A trial order will convince you that VICTOR STARCH has no equal on the market.

THE KEEVER STARCH COMPANY, Columbus, Ohio

Southern Agent: MR. JAS. H. MAXWELL, Greenville, S. C.

If you are not already using VICTOR STARCH call on our representative for a demonstration at your convenience.

TELEPHONE
RECTOR 8840, 6662

CABLE ADDRESS
MADEROBRO

Madero Bros.

Incorporated

Chemical Dept.

115 Broadway, New York

QUEBRACHO EXTRACT
LOGWOOD EXTRACT
SOLID LOGWOOD
FUSTIC EXTRACT
HEMATINE CRYSTALS
ANILINE DYES

SODA ASH
CAUSTIC SODA
BLUE VITRIOL
CHLORIDE OF LIME
SULPHURIC ACID
NITRIC ACID
MURIATIC ACID
AMMONIA
CHLORATE OF POTASH
MURIATE OF POTASH
ALL OTHER CHEMICALS
BICHROMATE OF SODA
BICHROMATE OF POTASH
CITRIC ACID
TARTARIC ACID
TANNIC ACID

We are receiving regular and dependable supplies of the following dyes, and will be pleased to submit quotations and samples for your approval.

Fast Vat Dyes

Ciba Indigo — Ciba Blue — Ciba Violet
Ciba Blue, Green Shade — Cibanon Olive

Chrome Colors

Steam Black — Cloth Fast Blue — Gallocyanine
Chrome Fast Yellow — Fast Chrome Black

Basic Dyes

Rhodamine — Auramine — News Blue
Bismarck Brown — Basic Green — Methyl Violet
Methylene Blue

Sulphur Dyes for Cotton

Zeta Blue — Pyrogen Direct Blue — Zeta Black
Pyrogen Green — Sulphur Khaki — Sulphur Cutch
Pyrogen Yellow — Pyrogen Indigo

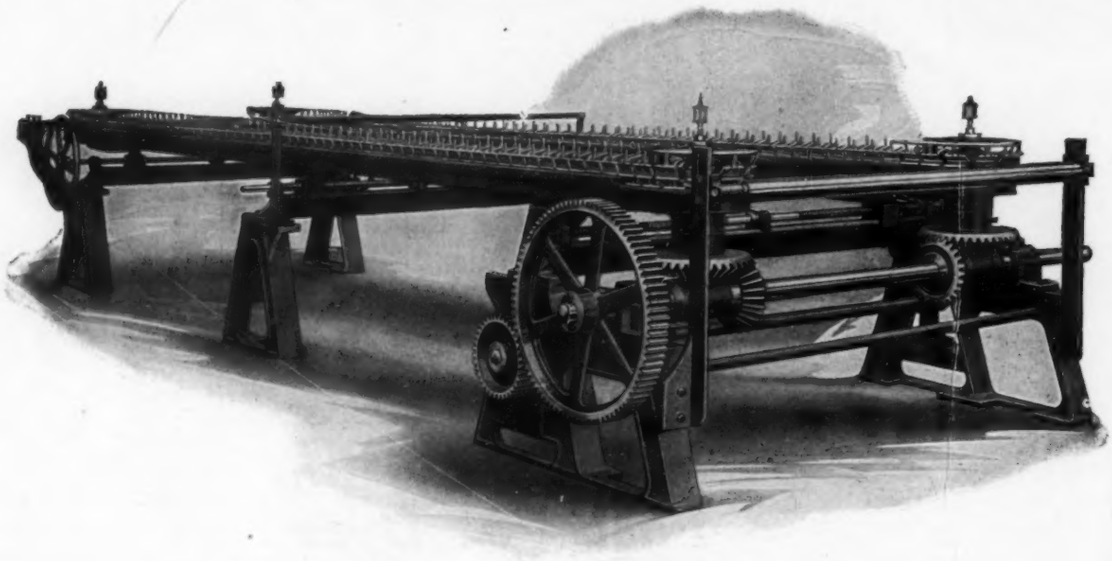
Acid Dyes

Carmoisine — Indigotine — Azo Rubine
Induline — Benzyl Black — Orange 2R
Acid Black 4B — Acid Wool Orange — Indigo Extract
Brilliant Scarlet — Kiton Fast Orange

Write or Wire

A. KLIPSTEIN & COMPANY

644-652 Greenwich St., NEW YORK CITY



Automatic Tentering Machine

It is impossible to list here the ever-growing family of Butterworth Finishing Machines.

Suffice to say that once a fabric is woven, we make a machine for every process till it reaches market.

We solicit your inquiries, whether or not you are a customer present or prospective.

The Butterworth Line includes:

Bleaching Machines
Drying Machines
Singeing Machines
Mercerizing Ranges
Hydraulic Presses
Dyeing Machines
Soaping Machines
Tentering Machines
Mangles (all kinds)
Calenders (all kinds)
Color Kettles

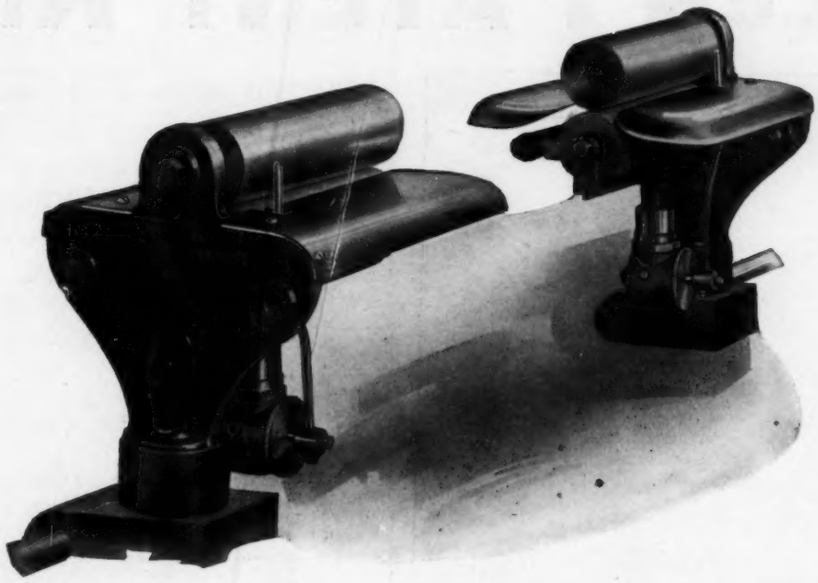
FINISHING Butterworth MACHINERY

H. W. BUTTERWO

Providence Office: Turk's Head Building.

PHILADELP H

38-39



The Foxwell Pneumatic Guider

Practical mill men are realizing more and more what the "Foxwell" Guider will do for them

The mechanical "hands" of this automatic feeder displace a human "hand."

It economizes floor space and increases out-put. Material enters a machine so smoothly that its finish is improved.

FINISHING
Butterworth
MACHINERY

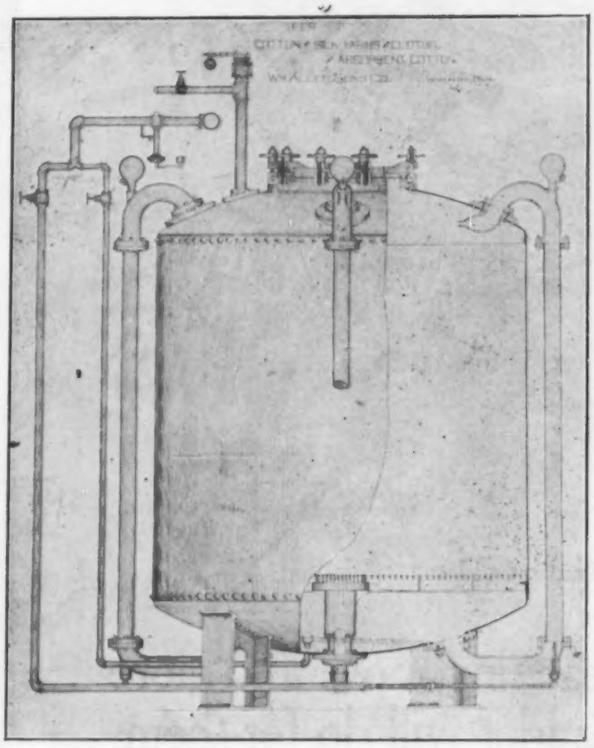
RTH & SONS CO.

HIA, PA.

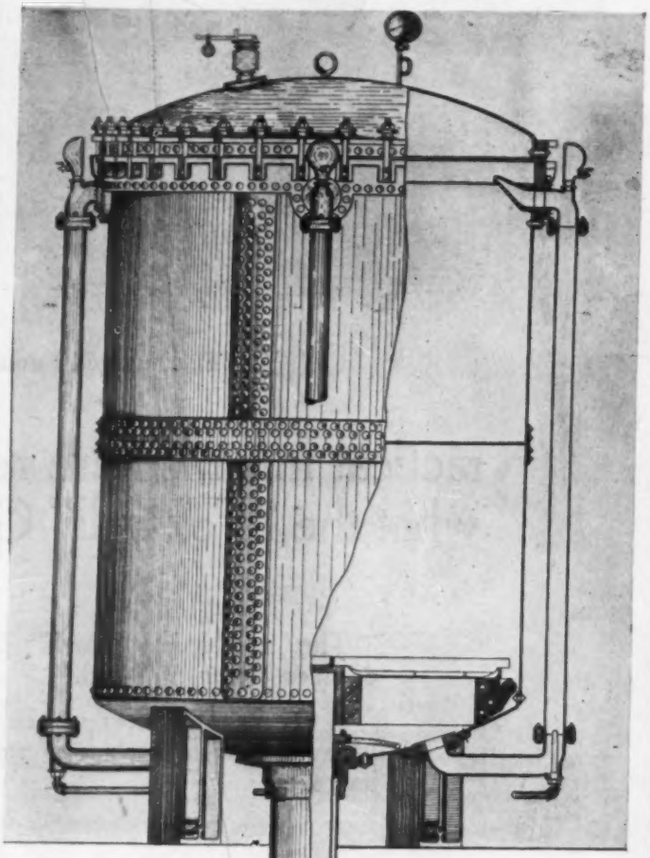
Established 1820

For Efficiency in Bleaching Use

ALLEN PATENT KIERS



If you desire to improve your present system, and secure more uniform results with a minimum of steam consumption, an Allen Patent Kier will meet every demand for more efficiency and economy.



THERE'S an Allen Patent Kier for every purpose. The type shown above is the "ALLEN INJECTOR" KIER, which is one of the finest injector kiers made. It gives excellent results, has a strong and rapid circulation and is very economical in use of steam.

The following extract from a letter received from a large mill is typical of the many testimonials we have on file: *"We note that in the new type kiers the liquor can be brought to a boiling point very much quicker than in the old type, thereby saving considerable time in the boil-off."*

The type shown at the right is our "ALLEN HYDRAULIC" KIER. This kier, for boiling raw stock, is a wonderful time and trouble saver. It can be unloaded in thirty minutes.

Another kier that we manufacture is the "ALLEN WORCESTER" KIER. This is the kier which is becoming so popular. It is replacing scores of other types, having proved its efficiency and economy in the finest mills in the country. The New "Worcester" Kier is mechanically correct. A rapid and positive circulation is supplied by the motor or steam driven pump and an unvarying strength of liquor maintained throughout the boil.

Every type of Allen Patent Kier is mechanically correct in every detail. No live steam is admitted to the kier. They assure enormous savings in steam, labor, fuel, chemicals and water; and the results are always absolutely uniform and up to the finest requirements.

Investigate the possibilities of improving your plant. Let us show how the Allen Kiers will increase your bleach room efficiency.

We also manufacture The Allen Improved LOGWOOD EXTRACTOR for extracting the coloring matter from Logwood Chips, and a complete line of CAUSTIC MIXING TANKS and STEAM BOXES and will be very pleased to give full particulars concerning them. Let us hear from you if you are at all interested in such equipment.

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Wm. Allen Sons Co., Prop.

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HOLLAND ANILINE CO.

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KALI HYDROXY OIL

Made from American Oils on an American Process

is Guaranteed to contain no Castor Oil. It dissolves clear in water and makes no emulsion. For kiering or wetting out before mercerizing or bleaching it is unsurpassed. Permits lye to penetrate and produce even mercerization and a better bleach. For soaking silk before winding, boiling off and finishing, in the dye bath, and for whatever other purpose a Sulphonated Castor Oil has been used.

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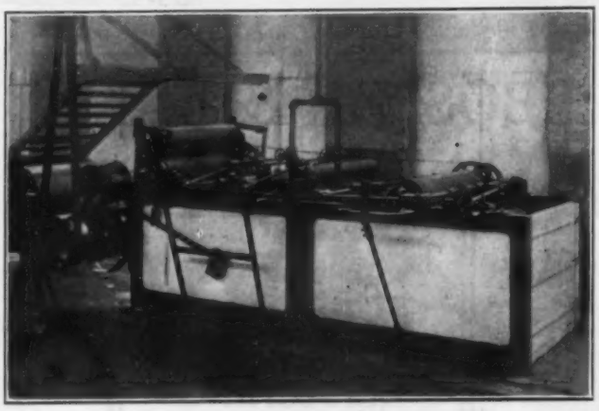

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Built with two compartments. The first compartment which contains a soap solution has two rotary brushes, and two vibrating brushes working on the cloth. In the second or washing compartment the cloth in passing over the immersion rollers is moved from side to side in such a manner as to remove reed marks.

Machine is connected direct to the cans and Tentering machine. Correspondence solicited.

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Dye Sulphur, Vat Colors, Cutch or Fustic in this

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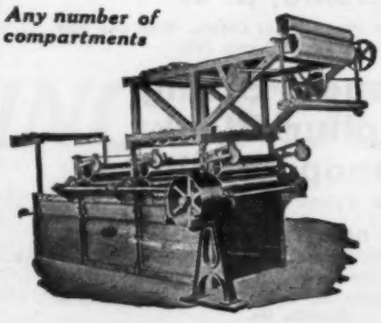

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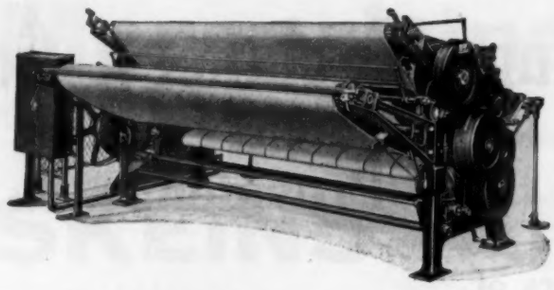

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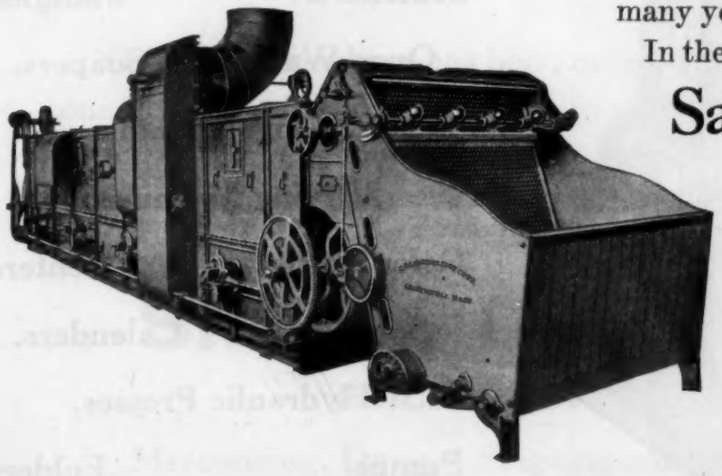

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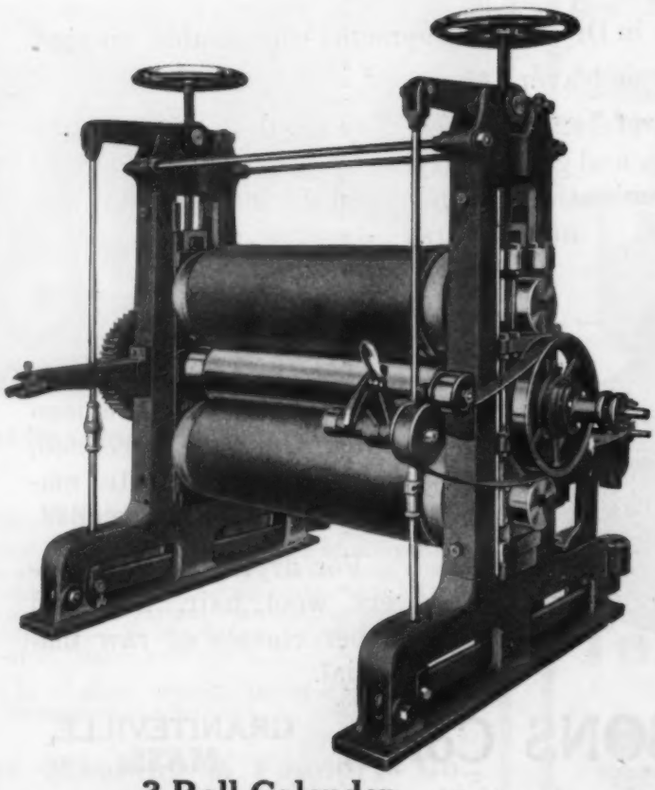

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FOR

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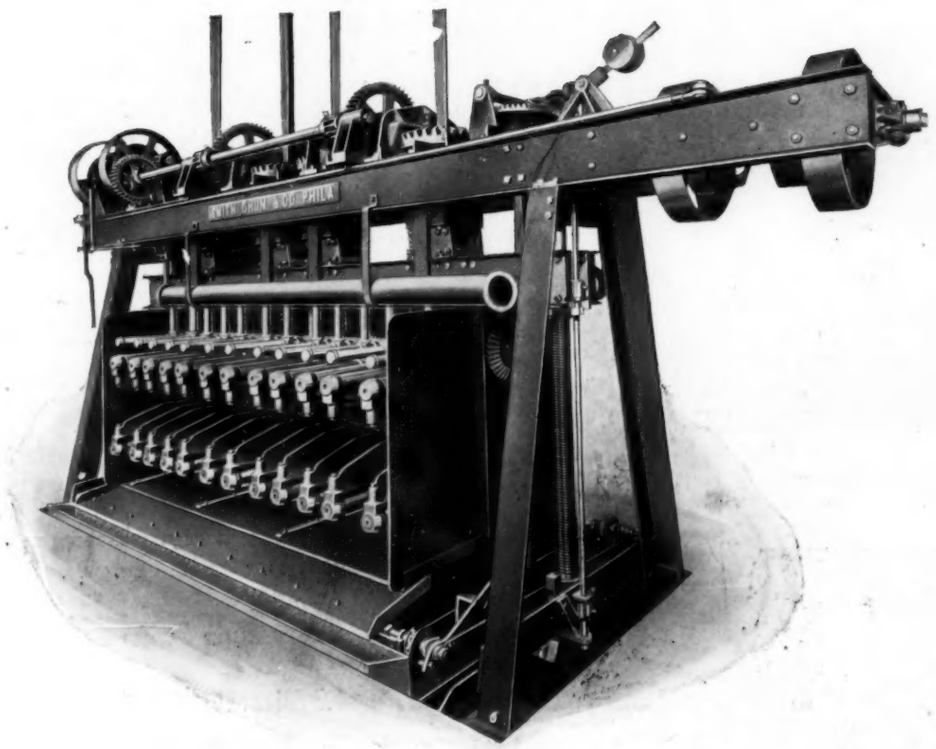

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